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Max Hanstorfer

Network

Railways of Australia Quarterly

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July, August, September 1987
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Revolutionary changes for V/Line (page 6)

Australia wins big Malaysian Contract (page 9)

Vision for the future — SRA (page 30)

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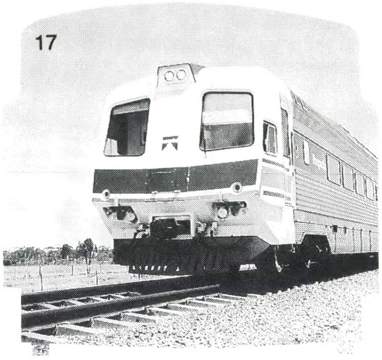

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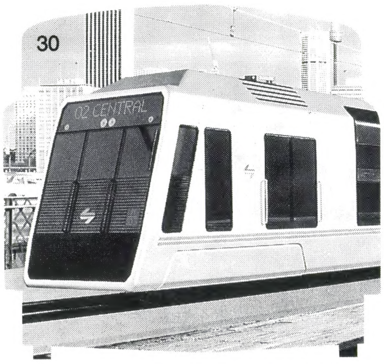

State Rail Authority of N.S.W.

Queensland Railways

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Front Cover:

State Rail Authority of N.S.W. passenger flagship, the XPT. SRA recently celebrated the fifth birthday of its introduction to services in that State.

Our only requirement of writers and personalities who contribute to Network is that they be informative or entertaining and that their subject has relevance to the wide interests of railwaymen today. Naturally, there will be occasions when their viewpoints or opinions run contrary to those of the editor or to Railways of Australia. We must accept that these differences are among the elements essential to the presentation of a lively and interesting magazine.

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The
EXECUTIVE
DIRECTOR'S
column

Jewel in the freight crown

Recently I had the pleasure of travelling across Australia with a visiting delegation of Chinese railwaymen — more of that in a later issue of Network.

The journey gave all of us the opportunity of seeing at first hand what is fast becoming a jewel in Australia's general traffic rail crown — intermodal movement.

Rail moved very early into containerisation - specially designed boxes moved biscuits from factories in Sydney to country destinations.

Small steel boxes were used later in general freight to overcome transshipment problems at border stations, before the advent of the standard gauge linking all of Australia's capital cities.

When shipping containers first made their appearance and an international standard was developed rail, in turn, developed specialised methods of handling them.

Today, the managements of all of Australia's rail Systems recognise that, in this way, rail is well placed to achieve its rightful role in the nation's transport system.

We excel at long distance haulage, from terminal to terminal, without intermediate shunting and marshalling.

We do not have the ability to deliver direct to the doors of most of our customers — but containers overcome this disadvantage — they are readily carried from rail terminals to the ultimate user.

We have also moved to adapt modern technology to Australian conditions

Piggybacking of semi-trailers across the Nullarbor Plain has long been a feature of rail's operations.

As "Network" has pointed out, in a recent story, modernised rollingstock incorporating on-wagon trailer hitches has speeded up and improved the efficiency of this operation between Adelaide, Perth and Alice Springs.

Construction of Australia's first low-tare mass "five-pack" articulated wagons to handle containers is well advanced.

Several rail systems are noting closely the development of trailer-train operations in both USA and Europe - and we shall see experiments with this type of vehicle in place in Australia before long.

To witness the passage of a two-kilometre-long 100 kilometres-per-hour, freight train over the Nullarbor Plain is to be impressed

It's a dynamic object traversing Australia's wilderness between east and west — and it demonstrates the ability of Australia's rail systems to co-operate in winning and retaining an appropriate share of traffic over a vital link.

Railway management and railway staff are paying close attention to the need for improvement of services in the customer's interest and of ensuring that those services are delivered ***on time.***

"Superfreighter" services link all capitals — express trains attracting freight at premium rates.

Now that these are in place, rail systems are bringing them to the attention of potential customers - the Victorian system is using a "Superman" theme on television to promote Superfreighter services and Queensland is following a similar theme for its intrastate "Maxifreight" and "Minifreight" services.

State Rail Authority of New South Wales has also used television to publicise "Trackfast" — a freight train network based on the new container terminal at Chullora outside Sydney.

Modern technology, of course, is only as good as the people that use it.

I find it heartening, as I travel throughout Australia, to meet rail staff who are obviously dedicated to ensure that we retain our position in Australia's freight industry.

I recall meeting a small dedicated team at Chullora concerned with the booking of "Superfreighter" container slots. Their attitude reflected real salesmanship.

And in Australia's most modern and largest intermodal terminal, Islington on the Australian National system, staff have used social club funds to design and produce an attractive key ring proclaiming, with pride, that Islington Freight Terminal is "Australia's Best."

The key ring is used for staff presentations and similar purposes.

The distinction is that it was a decision by the railway staff working at Islington to design and produce a memento of the place in which they carry out their duties.

These are but two examples of how railway ***staff*** are doing their best to ensure that Australia's rail "Jewel in the Crown" — intermodal traffic — fulfils its promise.

Michael Schrader

M. C. G. SCHRADER
EXECUTIVE DIRECTOR

M. C. G. Schrader

Market demands spawn re

V/Line is currently undertaking the most revolutionary change since the conversion from steam.
Like other rail systems throughout the world, the Victorian Railways in the past had no satisfactory process of change in line with market demands and the latest technology.
Air and road transport increased their market share at the expense of outmoded, inflexible and uncompetitive rail systems.

In 1983, the Government, through Transport Act, established V/Line with the directive to provide an efficient customer-oriented transport service using rail and road or a combination of both modes
V/Line is required to achieve full cost recovery on freight services and fifty percent cost recovery on passenger services.
V/Line's recently released Business Strategy Plan outlines the direction for cost recovery to be taken by the operations and business divisions.
In order to achieve the financial objectives and be responsive to market demands, V/Line has to undertake widespread structural, technological and operational changes, including new work practices, manpower reviews and reorganisation, to more efficiently utilise resources.
Many projects incorporate all of these changes and sometimes include large scale capital works.
It is anticipated that more than eighty change projects will have been completed by 1990, with fifty-five currently being designed or implemented.

Major push to increase market share.

The Manager, Priority Projects, Frank Wagner (seated), with Planning and Scheduling Engineer, Kate Wragge and Project Manager (Disposal of Assets) Peter Willis.

Every division and department is involved in these changes which embrace new systems and skills in the provision of a new generation of transport and travel services to increase market share.
As part of the process of planning and implementing change, V/Line set up a Priority Projects Department in 1985, within the Transport Operations Division, to carry out a number of change projects.
These are largely operational and organisational changes which affect all areas.
"Network" recently asked Frank Wagner, the Manager of Priority Projects, about the role of his department and its work.

Q. ***What has been achieved so far? What projects are underway and what effect will they have in future?***

A. "So far, we have thirty-three change projects on the books, twenty of which are either being developed or in the process of completion. The first project, two-man crewing of freight trains, has already been completed. It cost nearly $5 million to implement (with staff retraining and locomotive modifications) and will save V/Line more than $12 million a year — at 1985 dollar values.
We are currently looking at potential long term cost-savings of $100 million annually at a cost of $100 million on project implementation.
Most projects are cost-saving, but many have a direct or indirect revenue-earning yield.
The disposal of redundant wagons and scrap rail on closed lines, for example, are commercial projects which provide a financial return from the managed disposal of surplus assets.

olutionary change for V/Line

The re-organisation of the Melbourne Yard and Freight Terminal and new carriage and wagon maintenance facilities are both cost-saving projects which will also increase revenue by improving our services.'

Q. ***We are working towards a systematic co-ordination of business forecasts with operational and manpower requirements. Does the business management decision come first and then your department puts those policies into effect?***

A. "Yes, where change is needed to meet the business objective, a Project Group is formed to design and implement the change project.

There is a wide range of changes.

For example, V/Line has decided to introduce more responsive services at reduced operating costs, including more efficient block trains.

A block train has a set number of wagons and runs on a regular schedule between one point and another.

Priority projects the motivating catalyst.

Essentially, V/Line is planning to run fewer, larger and more reliable trains on each corridor.

This means that there will be reduced double handling of freight, less shunting and marshalling of trains.

It also implies a greater power to weight ratio of trains, with new locomotives and a rationalisation of the locomotive fleet.

These requirements further affect train crew rostering, yard rationalisation, locomotive maintenance, line upgrading and so on across the network.

As these projects are put in place, they provide a basis by which future business planning and management processes can be further developed and quantified.

The composition of the future locomotive fleet, for example, will depend upon network rationalisation, overhaul and maintenance costs, the implementation of the Canac proposals for the grain freight task and other factors, including the effects of future change projects."

Q. ***How does the Priority Projects Department work in with existing line management, the unions and V/Line staff?***

A. "A change project can be likened to a product.

It is designed, tested and built in response to demand. It goes through different stages of development — the project life cycle — to the monitoring "after sale service" stage.

Each project needs different planning controls and performance testing techniques.

When there is a perceived need for a change project, our planners liaise with all parties involved and set up the project team to ensure its practical and acceptable implementation.

In the first stage, we research and analyse the product from conception, consultation and development to cost-benefit testing.

If the project is then approved, the management team initiates its step by step installation in appropriate consultation with government, the unions and V/Line management and staff.

Part of the project installation includes the establishment of performance monitoring techniques and programs.

We have to be able to identify and correct any deviations from the plan by computer analysis and monitoring of trends and forecasts.

The project control system must generate summary and detailed information for different levels of management.

Finally, the project management team integrates the project with line management. It hands over the product.

It does not take over or superimpose itself on existing management. The project becomes integral to the whole modus operandi of V/Line within the relevant management structure."

Q. ***Is it necessary for the change project team to cut across a firmly established set of values throughout the organisation?***

A. "Project management is about building for the future in a practical manner — whether it be an oil rig or a new way of doing things.

There is likely to be some controversy, although conflict is also a catalyst for change.

A major function of project management is to develop manpower plans for restructuring to meet business demands.

These plans are based on constructive negotiation of a new and mutually beneficial situation.

(continued on page 18)

The clip

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Australian light rail system

Critical contract signed for K.L. project

On May 1, 1987 an Australian consortium backed by the Australian Trade Commission (AUSTRADE) signed the project management contract for building the $60 million first stage of the Kuala Lumpur Metrolink Light Rail System.

Trade Minister John Dawkins announced the success in Canberra. "Australia won the contract by combining its skills in transport planning, engineering and operation together with entrepreneurial elements of real estate, development and financial planning," Mr Dawkins said.
The consortium comprises prominent transportation consultants Pak Poy and Kneebone of Adelaide and Econsult of Sydney with John Holland as the construction manager.

The technical and operational advisor is the Metropolitan Transit Authority of Victoria.
The Met is an associate member system in Railways of Australia.

The value of the Malaysian project management contract represents over $8 million in Australia's packaged offer of $50 million worth of light rail goods and services for the $60 million first stage of the Metrolink.

The complete Stage 1 light rail project will cost $60 million.
The project management contract covers establishment and capitalisation of Metrolink, the usual engineering design and construction supervision, and operational planning, supervision and training.

The project will convert 13 route-km of little used suburban rail lines and empty city property in eastern Kuala Lumpur into a modern electric light rail system with (additional to the $60 million) associated building developments.

The contract was the first major export win in the railway industry made through joint efforts of the Australian Railway Industry Committee (ARIC), AUSTRADE, and an Australian rail operator.

Kuala Lumpur's Problem

Like many cities, Kuala Lumpur — affectionately known as KL — and its Klang Valley region are totally road-dependent for urban transport.
There is serious traffic congestion. Even where there are first-class highways outside the immediate city centre, traffic on them clogs to a standstill during the peak.

In recent years, proposals have been made for an elaborate regional light rail system with coupled trams operating on extensive viaduct (conceptually similar to that recently opened in Manila).
Other proposals would have involved the first large scale application of the cable-supported Aerobus system.
These proposals, advocated by Belgian and French consortia, have carried price tags of up to $1400 million (Australian) and have envisaged public sector ownership and operation.
The Malaysian Government decided that under today's economic conditions, it simply could not afford either of these options.

Privatisation

The Malaysian Government is pursuing a policy of privatisation.
Urban public transport in KL (bus, minibus, taxi) has traditionally been privatised since the Malayan Railway Administration (KTM) ceased suburban train operations over a decade ago.

The Government seeks to privatise KTM; Metrolink is the first practical application of this policy.
The Government was therefore amenable to a proposition from the Malaysian private sector for resolving the urban transport problem — without Government guarantees of loans, cash grants, or revenue subsidies.
Equity capital would be strictly risk capital. Loan capital would have to be properly secured, and be repaid at commercial rates.
The promoters, Metrolink Sdn Bhd, are Malaysian business interests who have satisfied the Malaysian Government of their ability to do these things and deliver the people of KL a working system in return for a regional light rail franchise and lease of Government railway assets (track, land, etc.).

Many years' effort by the Metrolink Board members led to this result.
The Malaysian Government has directed that Metrolink stock be offered to affected local interests (e.g. bus and taxi operators) on a priority basis.
While the main equity stock holders in Metrolink are Malaysians, the Malaysian government has permitted foreign equity investors. Pak Poy and Kneebone, the Australian project managers, have already been approached by several Australian investors in this context.

Metrolink is unusual — possibly unique — in that for the first time in many decades, a private sector company had deliberately chosen to enter the traditionally unprofitable business of building and operating, without direct subsidy, a light rail (i.e. tram) system.
The only known tram operations remaining in private hands elsewhere are on Hong Kong island (the HK Tramways Company) and in Japan — and these are old-established systems.

. . . goes to Malaysia

So how could a group of private Malaysian entrepreneurs backed by the expertise of Australians even remotely hope to fund, build and operate a completely new system in the traditionally money-losing tram business?

Particularly, be it noted, in view of today's costs, when even urban bus operators unburdened by having to provide their "track" often find it impossible to clear their working expenses.

The first reason lies in Metrolink's strict control of the level of ***capitalisation.*** Metrolink is basically a conversion job done at a sensible level of cost, rather than a totally new build. Track is double only where it has to be. There are no extensive tunnels or long elevated viaducts. There are no monumental stations, hectares of circulating halls with tiled floors and walls, escalators, and airconditioned space.

All these things are in the "nice to have" category; a private sector business cannot afford them.

In contrast, the trams will be airconditioned — which is a significant extra cost. Airconditioning is a commercial requirement, needed to compete with a motor car.

Through it, a cool short-duration stand in the tram is competitive with being traffic-jammed in a hard, cramped seat in a hot, crowded bus.

Metrolink, then, is to be engineered and operated expressly to fit its market and exactly what that market can afford — nothing less, and never anything more.

Through this strictly commercial approach the complete 4-stage Metrolink can, at a cost of $200-250m, serve much of the area of previous $1400m options.

Through this approach, the option of

(continued next page)

Main picture: An MTA 2001 Class lightrail tram similar to those which will be used on the KL project.

reserved track system will be possible where, under the traditional political rules for providing a public-sector system, the option would not have been.

The second key to making a private sector light rail system possible is the strong potential for ***high revenue levels.***

In KL, standards of living are (by Australian standards) relatively high. Levels of private car ownership are relatively low, but despite this congested city roads and slow, hot and uncomfortable trips in packed buses encourage rapid transit patronage.

The city is expanding with high-rise housing very close to the Metrolink tracks.

At the Government's direction, transit operations will be co-ordinated; buses will feed the trunk light rail route.

There is also a commercial and market-based approach to granting concession fares. If Government is to give discount travel privileges, it would subsidise the needy patrons, rather than holding fares down to an artificial level and subsidising losses in the transport system itself; this concept itself is somewhat novel.

Operating cost prospects in KL are low.

Labour productivity will be very high from one-person operation of high capacity trams (in coupled sets during the peak) and private-sector freedoms in business management.

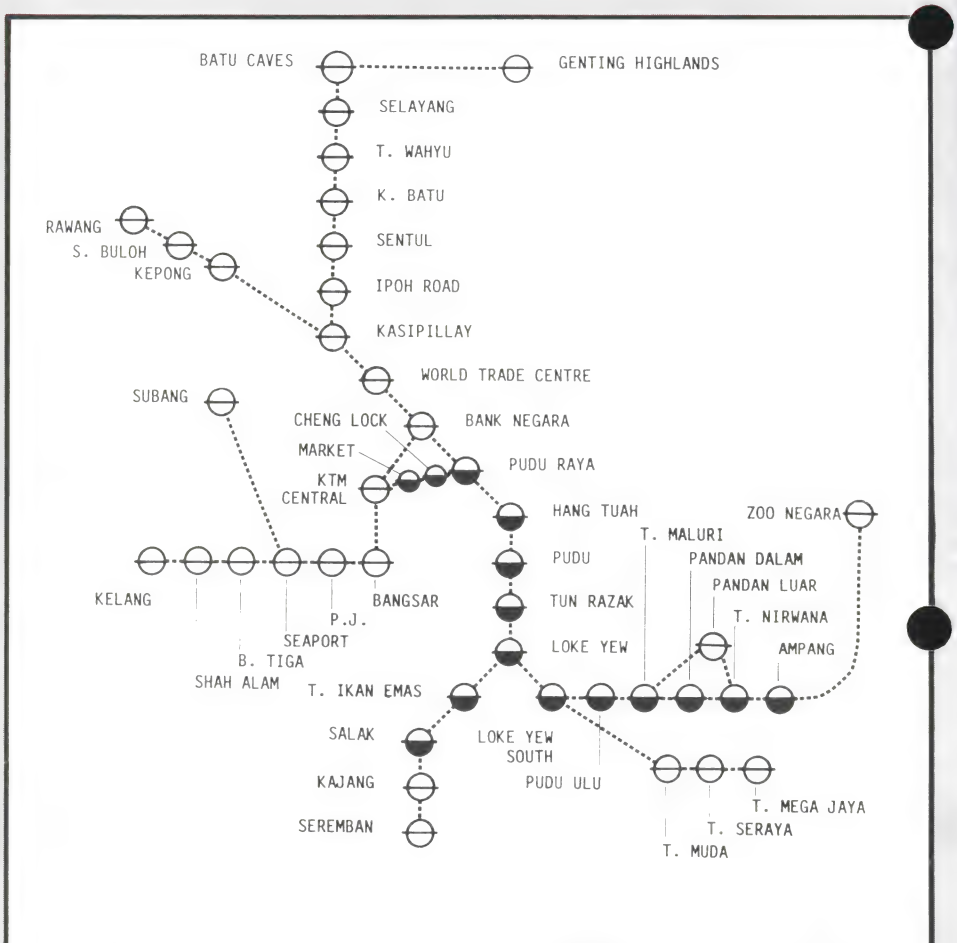
While the figures are confidential, studies by the consultants have shown that with careful commercial management the light rail side is expected to make a useful operating profit (as Hong Kong's company-operated trams do.)

However, the project also covers major ***real property development.***

While the KL real estate market is currently depressed, Metrolink is a long-term Australian vote of confidence in Malaysia as Metrolink's market emphasis is grass-roots.

The Metrolink development will not depend for success on luxury apartments, new international hotels, or prestige office space. Its emphasis is essentially rooted in the needs of the ordinary Malaysian citizen for medium-cost housing, shops, food concessions, entertainment, car parks, etc.

The pitch of its marketing is mid-market, moving up-market with the rising standards of living and personal income.



PROPOSED FUTURE DEVELOPMENT OF METROLINK

The main returns on the overall investment will come from the peripheral development activity — activity made possible only by the existence of the new tram system, and the people it carries.

Where Metrolink goes

From Ampang (13 km east of Kuala Lumpur), the stage 1 section of Metrolink will reduce the trip to the CBD from its present 45-60 minutes to about 20 minutes.

The last part of the trip covers Jalan Cheng Lock, a 6-lane city street that was once the roadbed of the first KL-Singapore main line railway.

Subsequently cut back to a dead end at Sultan St, now built over as a bus station, a rail branch to Ampang ran up to 75 steam rail cars between the wars, and after 1959 stainless steel diesel rail cars built by Comeng.

The ultimate 4-stage Metrolink system will similarly use rail alignment to bypass congestion elsewhere, providing fast airconditioned electric rapid transit service on a total of seven light rail corridors into and across KL, including that to Subang Airport.

Stage 1 covers two of these corridors (to the East and SE of the City, and through its southern CBD area.)

This section of Metrolink will also have, and serve, a total of five major public transport interchanges, two of them completely new.

Facilities also include drop-and-ride and extensive provision for park-and-ride (the latter usually with service station facilities and secured parking).

Key technical features

The Metrolink project is ***not*** a suburban electric train system, or a subway, or an elevated metro, or a monorail.

Metrolink is a light rail system — a tram-like, reserved track/on-street system. Metrolink will look like a Melbourne tram system, but have many sections resembling a railway. It will parallel and perhaps prototype, similar conversions planned in Melbourne.

The most important technical characteristics of the KL Metrolink in commercial terms, is its ability to approach the capacity of many electric rail systems at a fraction of the cost.

Metrolink will use the KTM standard 1,000mm track gauge. Because one section of it will carry KTM freight trains in the small hours the LR vehicle wheels and the points will be to railway and not tram standards.

Trams and trains will not, however, inter-work on the same tracks

On open line, ballasted track with welded rails and local timber sleepers will be used.

Substantial repairs to earthworks and drainage, and reballasting are required to bring the disused/little used branch tracks up to 90km/h light rail standards.

Some grade-separation works are needed. The track will be fenced.

The street-railway sections of Metrolink will use the MTA's track construction, which is claimed to be the cheapest in use anywhere in the world.

Turnouts will be QR-style trailable facing points, or power-operated points with the approaching driver controlling route selection.

Except on street sections Metrolink stations will be at-grade structures, fully fenced and enclosed under an overall roof.

Electrification will be 750vdc overhead, with mixed single-wire and catenary construction carried on (probably) wood poles on the open sections.

Sub-stations will be remotely controlled. Pickup will be by pantograph.

Single-line sections will have a simple block signalling system with magnetic detection and tail-of-train checkout.

The light rail vehicles will be very similar to the MTA of Victoria's latest two-piece articulated trams (Class 2001). The KL vehicles will, however, be engineered for 1,000 mm gauge, with full airconditioning and greater standing space.

The cars will have provision for multiple operation in coupled sets of up to 3 cars (i.e. six bodies), and electric braking.

These light rail trains can lift up to 750 people at a time, and the ultimate system will be able to run every two minutes.

The Australian content in the $50m AUSTRADE package for stage 1 covers full project management and engineering, and suppl;y of the vehicles, fixed electrical and signalling equipment, communications and control, depot equipment, and revenue collection systems.

The arrangements for this are being co-ordinated via the Australian Railway Industry Committee, ARIC.

There is a substantial transfer of technology to Malaysia envisaged under the programme.

Operation by Malaysians, under Malaysian management, is envisaged from Day 1.

Engineering contracts are being negotiated with the Project Manager representing Metrolink in dealings with Australian and Malaysian contractors.

All other things being equal, the AUSTRADE package gives preference to Australian rather than foreign-licensed technology.

Australia's effort to date

Australian involvement dates from late 1985, when Mr John Underhill, a then locally-resident entrepreneur, railway enthusiast, and ideas man first approached the Australian Trade Commissioner in KL with the idea of using Australian skills for the privatised conversion of suburban rail lines to light rail.

In contrast to the generally-expected negative reaction, Australia took the idea of an entrepreneurial light rail system seriously.

In fact, AUSTRADE (formed 6 January, 1986) saw sufficient merit in the concept to send its Manager, Railways (Ian Macfarlane) to Malaysia, and the MTA sent its Engineering Manager, Tram and Bus (Allan Nolan).

Ideas were developed in exchange through 1986, and the client tested prices from around the world.

Australia looked attractive. When the scheme reached the stage of justifying a full feasibility study, Australia offered this.

AUSTRADE called bids from consulting members of ARIC with the MTA of Victoria as a nominated technical sub-consultant.

The Pak Poy and Kneebone/Econsult/MTA bid was successful.

The consultant took the diverse range of initial ideas on markets, technical options, etc, through to the costed blueprint of a complete light rail system, and a business structure for a company in which both equity investors and AUSTRADE (the principal lender for the Australian content) could have confidence.

As previously advised, the real property development studies were an important part of this; today one needs a wide variety of skills to market railways internationally.

In parallel, the Export Development Group of AUSTRADE moved to reach increasingly firm understandings with the client; Macfarlane signed an initial memorandum with the Metrolink Board en route from the Railways Technical Mission to China (reported in the previous Network).

The Minister for Trade, Mr John Dawkins, visited Kuala Lumpur in December 1986.

His strong support for Metrolink, coupled with the Australian experts' opinion, is believed to have clinched the Malaysian Government decision on the feasibility of the project. It was a major factor in winning it for Australia.

The Metrolink Board visited Australia the following month (January 1987) and exchanged further understandings with senior AUSTRADE Executive, Dr Ed Druce. The Board revisited to sign the project management contract on Friday, 1 May 1987 — the first critical element of the Australian package.

How the job was won

This job was won for Australia, (away from major and well-placed European competitors who are still strongly active in the field) essentially by getting our act together:

- recognising the client's socio-political environment, and his unusual need
- helping Metrolink to develop a business proposition that they could sell to their Government, rather than waiting for something to happen and the client to come to Australian manufacturers
- having a strong industry with competitive goods and services to sell, integrated through its own export group, ARIC
- having, in the MTA of Victoria, a relevant and respected prototype light rail system operator
- bringing to bear a comprehensive, multi-disciplinary professional approach, thinking from first principles and where necessary laterally as well
- the willingness by EFIC, AUSTRADE's in-house finance and insurance organisation, to take a flexible approach towards new and novel kinds of business like this
- AUSTRADE's willingness to take commercial risks in helping the client to set up this business (for the studies might well have shown that the concept was unworkable)
- solid support from the Australian Government and the Minister for Trade, Mr John Dawkins.

Work proceeds on developing Stages 2-4 of Metrolink, and other projects.

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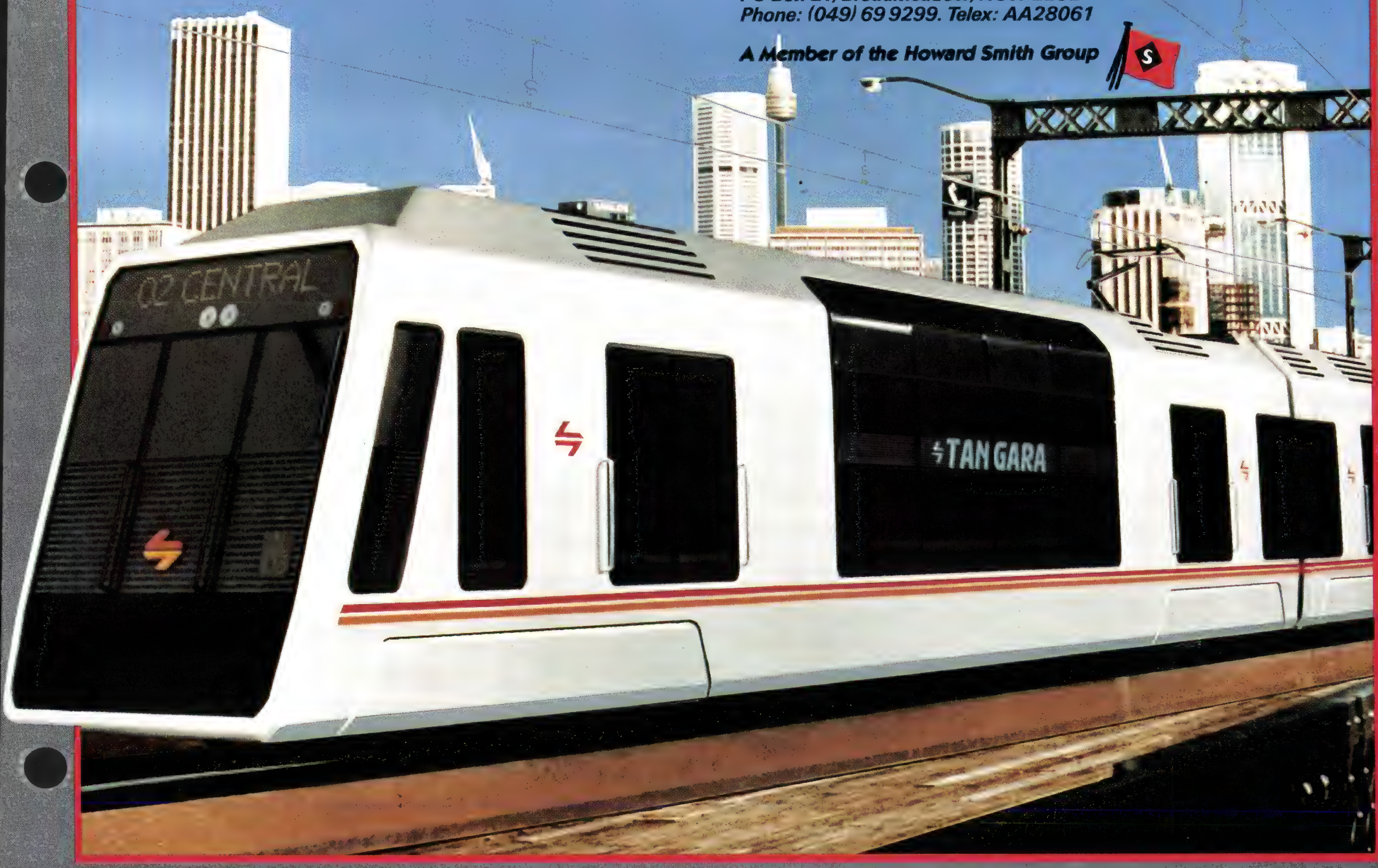


Peach 2644

Manchester scents light rail victory

By Ian Yearsley

Britain's Minister of Transport David Mitchell made no firm commitment of government funding when he opened Greater Manchester Passenger Transport Executive's three-week Project Light Rail demonstration on March 10.

His very presence alongside local politicians and sponsoring manufacturers during the run up to a general election was powerful evidence that the government is warming to proposals for light rail in provincial cities.

The purpose of the demonstration was to gain government approval and funding for the first phase of GMPTE's light rail plan, which is a 30 km north-south route from Bury to Altrincham.

This would be created by linking two British Rail lines over new on-street track through the city centre, including a spur to Piccadilly.

Conversion of these lines should reduce their operating deficit, which the PTE has to meet, from £2m to 300,000 a year.

It would require investment of £43m of which 50 per cent would be financed locally.

The urgent need to scrap the obsolete 1.2 kV dc electrification and rolling stock on the Bury line makes a decision pressing for BR and the PTE.

On a cost-per-kilometre basis, this is probably the cheapest of several British light rail schemes queueing up for government support.

The whole Manchester scheme hinges on construction of 3.5 km of double track to join up with BR suburban lines at Victoria, Piccadilly and Deansgate stations which lie around the periphery of the central business district.

So new construction is minimal.

Manchester's light rail plan conforms closely to criteria identified in the joint BR-London Regional Transport study (RG 3.87 p 131) which found that little was gained by simply converting existing suburban lines to light rail.

The major advantages flow from light rail extensions which allow major traffic objectives to be tapped, or previously separated lines to be linked.

According to the London study, costs for new light rail construction range from £1.1m to £2m per kilometre of double track on street, 0.7m to £2.1m segregated at grade, £5m to 8m for elevated construction, and £15m to £22m in tunnel.

Because GMPTE's proposed network makes so much use of existing BR track, the average infrastructure cost of 0.8m/km is well inside the guide costs established for London.

It has to be remembered also that if the government fails to approve the first stage of the light rail project, some 19m would be needed to replace existing rolling stock on both BR lines and re-electrify the Bury line at 25 kV.

Whereas conversion to light rail is expected to boost traffic by 67 per cent, replacement of BR assets would not increase ridership significantly.

With a major upsurge in rail traffic following the confusion caused by bus deregulation last October, closure of either route is no longer regarded as a serious option although the Department of Transport required the PTE to evaluate it.

The Debdale Park demonstration used 2 km of BR freight track that was once elelctrified at 1.5 kV dc.

Overhead line equipment destined for Tuen Mun (Hong Kong) was erected on the old structures, and fed about 700 V dc by the transformer and rectifier on a BR EMU parked on the 25kV Manchester-Glossop line.

An articulated car was borrowed from the Docklands Light Railway in London, which opens on July 30, and fitted temporarily with a Brecknell, Willis pantograph.

Sponsors of the demonstration were Balfour Beatty, Brel, Fairclough, GEC Transportation Projects, GMPTE and BR's London Midland Region.

In supporting the demonstration, suppliers are aware that Manchester's scheme is one of a number that are coming to fruition in British cities.

The fact that another transport minister, Lord Brabazon, not only extolled the virtues of light rail to the Institution of Mechanical Engineers on March 6, but pointed out that the Docklands technology could be "usefully applied in other areas" must surely be taken as encouragement by cities that have not advanced so far as Manchester.

Sheffield's bill reached parliament last November, at the same time as Manchester's, and the present hiccup in support from the City Council is probably no more than a tactical move in the face of forthcoming elections.

West Midlands PTE's Birmingham based scheme, as first presented, required extensive tunnelling in the city centre and appears to be stalled.

Lothian Region is developing a project for Edinburgh, while Advanced Transport for Avon wants to finance a Bristol based network privately.

Provided the government comes through with capital grants, all this activity indicates considerable potential for manufacturers which would provide a solid base for exports.

With BR and LRT actively looking at light rail for Croydon, not to mention its application to the outer ends of London Underground's Central line, the northern regions of Britain which complain loudly of neglect have an excellent case for demanding a slice of any funding available for new forms of rail-based public transport.

Another important factor is the reduction in operating subsidy which light rail offers.

The present government has shown itself quite willing to see BR and LUL invest more provided their revenue position is thereby improved.

The Manchester scheme would not only cut the PTE's budget for rail support; it would also allow BR to make useful economies.

Manchester's Victoria station could be downgraded with Trans-Pennine and Scottish services concentrated on Piccadilly.

The "Prospector" was the fastest (average speed) train in Australia until NSW's XPT began running to Albury at 89.7 km/h in August 1982.

Westrail's Prospector - new speed trials

Westrail has undertaken speed tests with its "Prospector" train on the Perth to Kalgoorlie run in a bid to slash jouney times on the service.
The trials have shown a reduction of two hours, from an eight to a six hour service, is feasible.

The capabilities of the Prospector were put to the test last month when the train was involved in a high-speed, one stop trial run between Perth Terminal and Kalgoorlie.

Results from the trial are sufficiently encouraging to warrant further investigation into running a six-hour service to Kalgoorlie on Friday evenings.
There are many good reasons to think that such a journey time is impossible — not least of them that it requires an average speed of 109 km/h compared with the 87 km/h of the present timetable.
However Westrail staff are working on the challenge.

Engineering staff need to know that the track will allow a general 20 km/h increase in speeds, while traffic staff are looking at the costs and possible revenue gains of a high-speed run, as well as the allocation of cars.
And Motive Power is investigating whether the ride will be too rough for passengers and whether the train has enough power in various consists of power and trailer cars. (The Prospector consists of eight cars, five of them powered and three unpowered.)

The reason for investigating a one-stop service to Kalgoorlie is the undue delays to the Friday night Prospector service.
So many passengers board and leave that train along the way that its timetable has had to be extended by 25 minutes to eight hours.
Last month's test Prospector departed Perth Terminal at 9.21 am and arrived at Kalgoorlie at 3.27 pm.
The maximum speeds approved for this test was 100 km/h from Midland to Avon Yard, 140 km/h from Avon Yard to Koolyanobbing and 130 km/h from Koolyanobbing to Kalgoorlie. In a number of areas, existing speeds were maintained whilst in others higher speeds were run.
The Prospector traversed the Avon Valley at a fairly constant 105/110 km/h. Normal operating speed for this section is 100 km/h.
From Avon to Koolyanobbing it was hoped to achieve a speed of 140 km/h as often as possible, but due to operational restrictions and a strong easterly headwind together with a low power/weight ratio lower speeds were generally recorded.

The super-elevation on curves of the standard gauge has been set for freight trains but this reduces the normal higher speeds of passenger trains for passenger comfort.
As an example, the nest of curves west of Burracoppin are restricted to 80 km/h to ensure passenger comfort but on this trip they were traversed at 120 km/h.
No passengers were aboard for the test run but recording equipment operated by members of the Motive Power section tested the ride comfort level that a passenger would experience.
By the time the Prospector reached Southern Cross, the normal running time had been reduced by 48 minutes.
Although the Prospector was scheduled to stop at Merredin for a five minute crew change it had an unscheduled stop of three minutes at East Guildford.
Other minor hold ups caused more valuable time to be lost. Without them the test train would have completed its journey in the six hours.

(continued from page 7)

There is always some negative reaction to change. Like any other long-established organisation, V/Line has a strong cultural history with positive and negative aspects — including some inherent resistance to making technological advances.

The project management structure is sensitive to the positive aspects, and does not seek to fragment the organisation to the point where it becomes unable to positively respond to change or inoperable with 'future shock'."

Q. ***Finally, you mentioned the different types of change projects. Can you briefly outline some of the operational projects and compare them to a technical, structural or commercially orientated project?***

A. "There are a number of major projects involving manpower rationalisation and retraining.

The shunting operations review and the train crew corridor rostering review are ongoing projects with goals in line with business requirements.

At this stage we are working towards a rationalisation of shunting operations involving two-thirds of the 950 shunting personnel, including enginemen and supervisors.

The train crew corridor rostering review project involves a new system for rationalisation of locomotive depots and crews.

Some depots are likely to close or reduce in size whilst there will be crew increases at some depots.

Widespread structural technological and operational changes.

It also involves the introduction of a new distance payment scheme for enginemen and the elimination of current distance restrictions.

V/Line currently requires 750 train crews for passenger and freight train services.

The proposed changes in train running operations discussed above (block train services, reduced shunting and a rationalisation of other freight train services) together with other initiatives should result in a total requirement of 500 to 550 train crews in the next few years.

At the same time, there is a driver training project which is specially aimed at accelerating the traditional driver training period and improving the quality of worklife for drivers and enginemen.

These are typically discrete operational projects.

The carriage maintenance project involves a comprehensive analysis of carriage maintenance practices to evaluate the requirements for a new carriage maintenance facility with a capital works component of $28 million.

This is a technical and operational project requiring a detailed assessment of a number of alternatives to the original construction proposal.

Costs had to be carefully assessed and different options evaluated for the most efficient, preventative maintenance program which will increase rolling stock availability and reduce maintenance costs and manpower requirements.

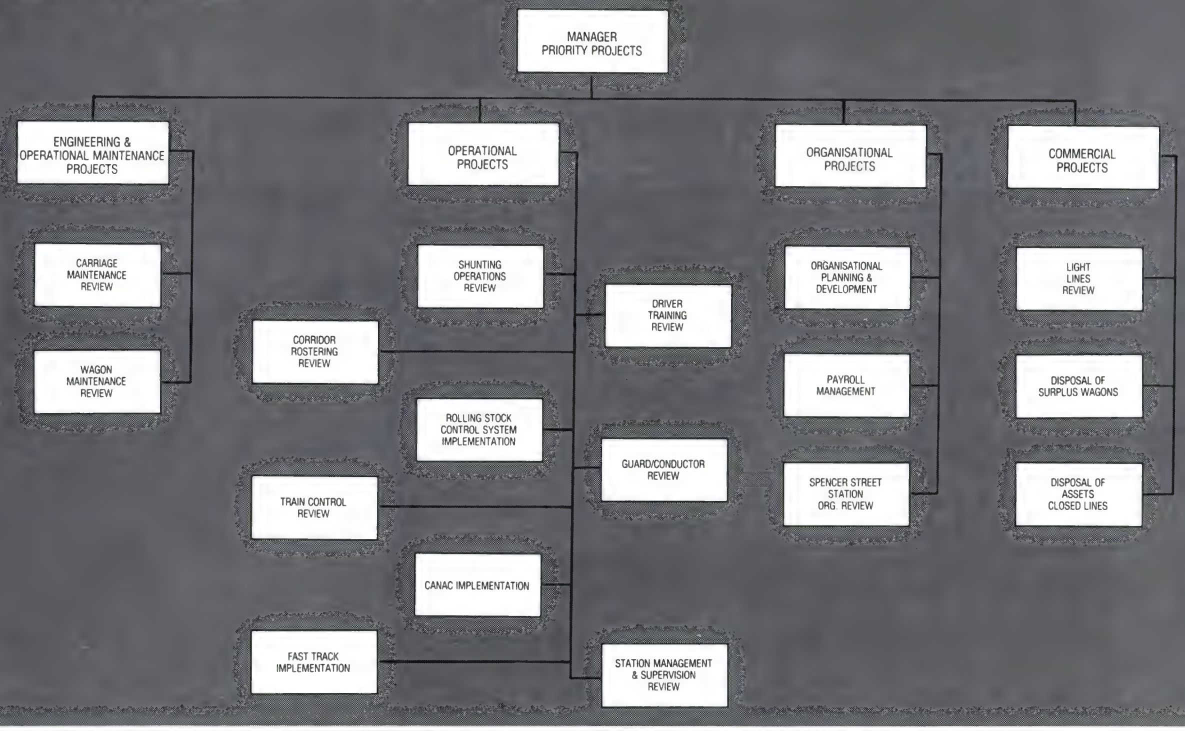
The wagon disposal project is an example of a commercial revenue-earning enterprise.

A total of 5000 old freight wagons will be disposed of over the next few years.

Approximately 500 of the first batch of 2500 wagons will be scrapped at Bendigo Workshops and the remaining wagons have been sold for removal and scrapping by contract.

By 1990, all of the old four wheel wagons will be replaced by modern bogie wagons.

In summary, our job is to build for the future and now is the time to implement the long-overdue changes through specific projects which will enable V/Line to achieve its business plans."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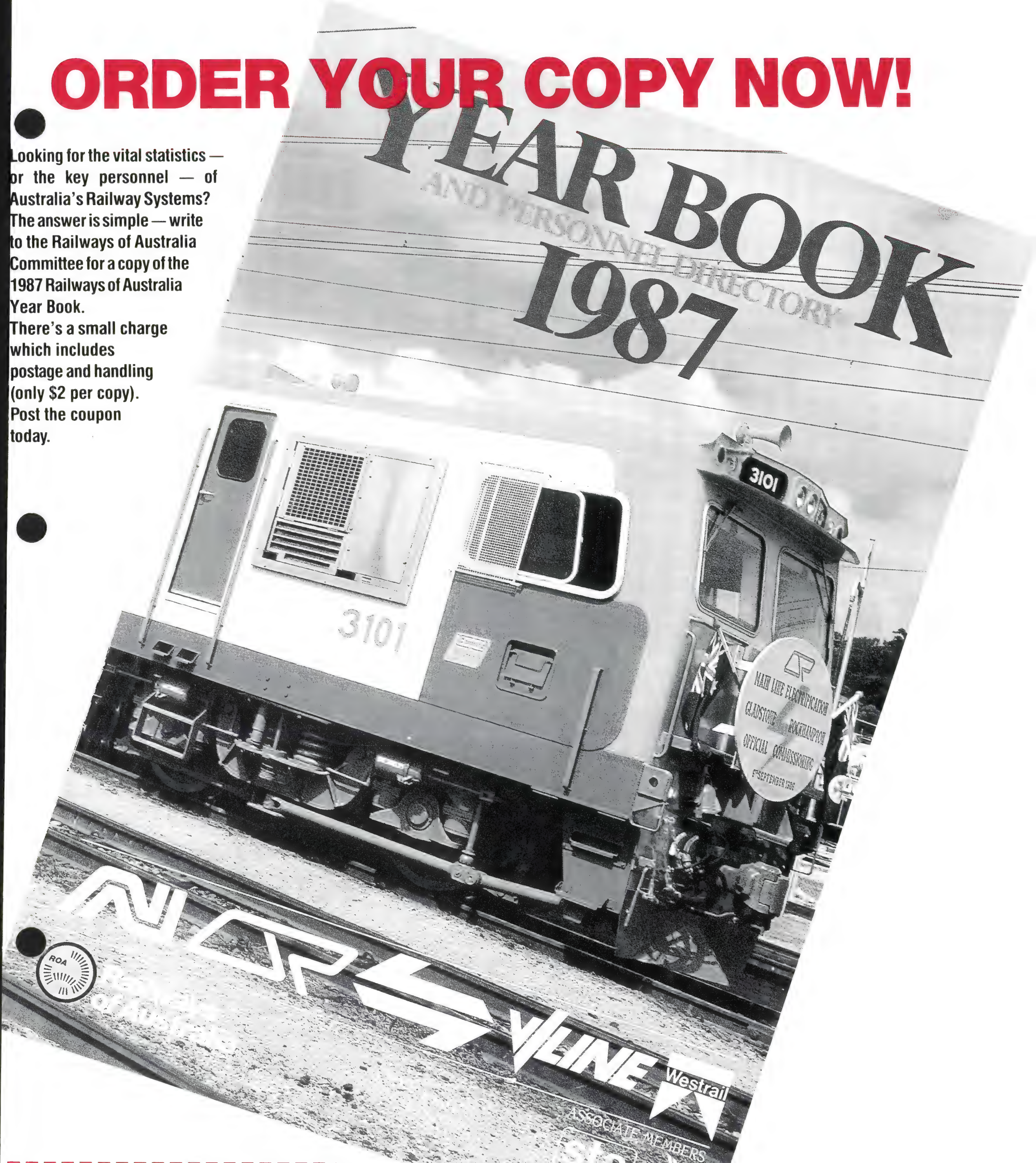

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looking

British Rail goes fo

In February 1988 a new locomotive will be rolled out of the railway works at Crewe in northwest England.

Called Electra, it will be the first of a class of electric locomotives being built for the east coast main line leading north from London, which is being electrified.

Electra will have a top speed of 225km/h and although this is not as fast as some trains running in France, unlike the French trains Electra will be operating on a line that was laid down a century and a half ago and not on a purpose-built high speed track.

One of the most technically advanced locomotives in the world, Electra continues a proud tradition that has been maintained in Britain ever since railways were conceived there at the beginning of the 19th century.

The harnessing of the power of steam was first realised by James Watt after he had mused over its potential while watching a kettle boil in the 18th century, but the first steam railway locomotive was built by a Cornish mining engineer, Richard Trevithick, in 1804.

First Trains Trevithick's locomotive proved too heavy for the flimsy track he had constructed and the first really successful application of steam traction to railways was made by George Stephenson's Locomotive in 1825 on the Stockton and Darlington Railway in northeast England.

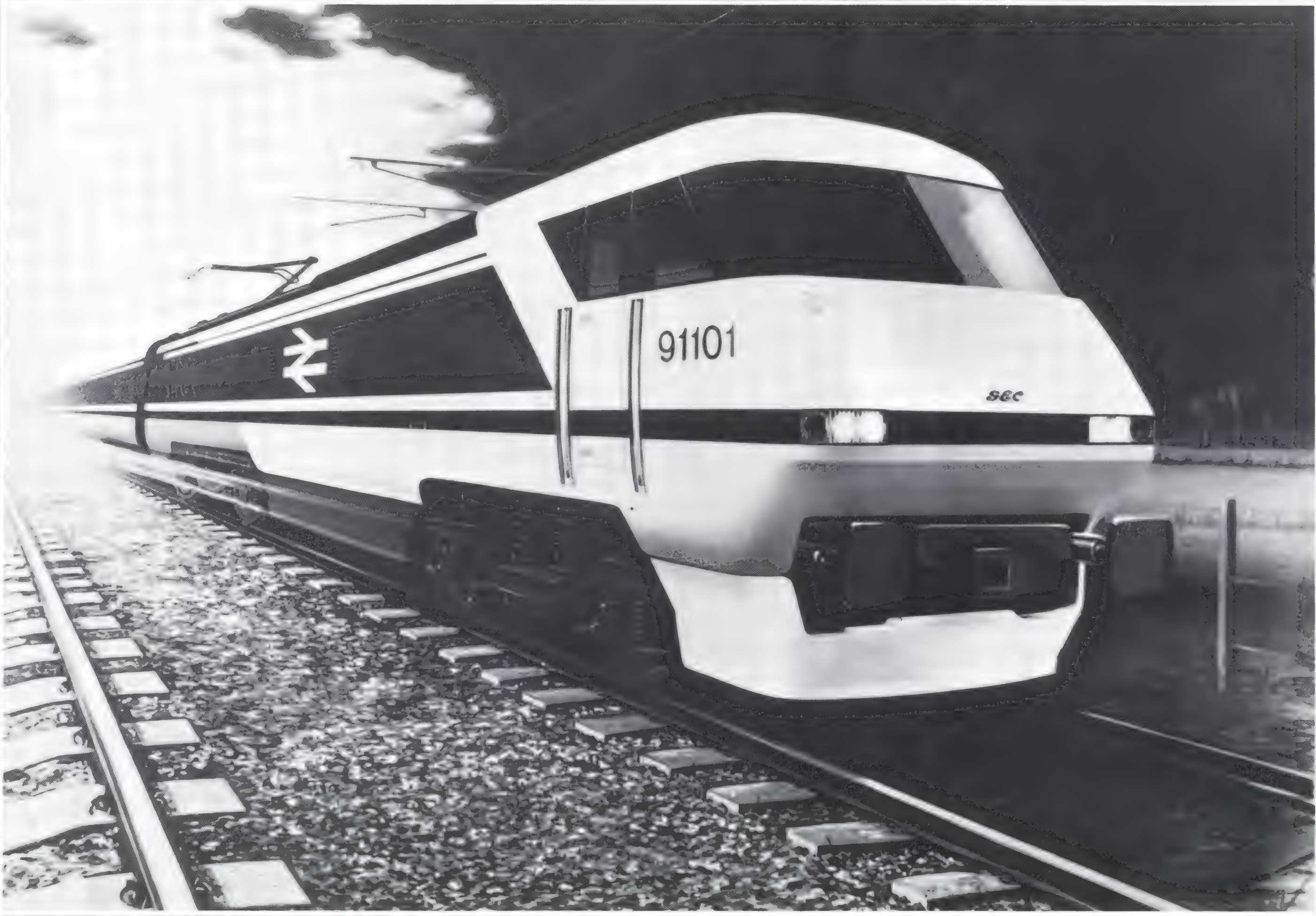
Stephenson is generally reckoned to be the 'father' of railways and he was the driving force behind the first large-scale commercial railway in the world, the Liverpool and Manchester, in northwest England, which opened in 1830.

Stephenson's Rocket easily won the trials to decide on the best form of motive power for the new railway and it was the true forerunner of all the world's steam locomotives.

The basic principles employed by Stephenson — water being heated in a multi-flue boiler with the expansive power of the steam being harnessed in pistons and the exhaust steam being used to draw air through the fire — have been used since then in all steam locomotives.

Various refinements have been introduced, of course, but if Stephenson was to be shown a steam locomotive built 150 years after his Rocket he would not have any difficulty in understanding the design.

Historic Routes George Stephenson and his son, Robert, established the Vulcan foundry at Newton-le-Willows in north west England in 1830, close to both the Liverpool and Manchester Railway and the port of Liverpool and it was there that Britain's locomotive export trade started.



An artist's impression of the new Electra.

ahead

speed with Electra

by James Abbot, "Modern Railways"

The Vulcan foundry supplied locomotives for the first railway in Russia, which opened in 1837, and went on with other British manufacturers to supply locomotives to all parts of the world.

Latin America and Britain's 19th century empire were the principal destinations.

Locomotives for India's first railway in 1853 were from Vulcan which went on to deliver an average of one locomotive a fortnight to the sub-continent over the next 100 years.

Competitors Arrive Steam locomotives are rugged, dependable and can use indigenous fuel — which explains why they are still in use in many parts of the world almost a century after alternative forms of railway traction were invented.

The electric and diesel locomotives that developed about the turn of the century were cleaner and less labour-intensive than their steam counterparts — although often more expensive to build.

Electric locomotives, however, were the first to challenge the supremacy of steam although at first they were used on small operations in northern Ireland and on the south coast of England.

That was in the 1880s and the first significant application of electric traction was on the City and South London Railway in 1890.

The success of this experiment made urban underground railways feasible — the problem of fumes from steam locomotives had hindered earlier expansion of urban transit systems.

In addition to the rapidly growing London underground tube system, electric traction was applied to suburban railways on the surface and later to main lines as well — but the heavy investment required by either a third rail or overhead wires to convey the electricity to the trains prevented it from completely displacing steam.

Diesel Power A more potent threat to the steam locomotive came slightly later, in the form of the diesel engine.

This made possible a form of locomotive which, like the steam variety, did not require extensive lineside apparatus.

A Scotsman, Ackroyd Stuart, had taken out patents on something resembling a modern diesel engine in the late 1880s, but it was the German, Dr Rudolph Diesel, who gave his name to this form of engine and who most rigorously supported its application to rail traction.

Dr Diesel was at work in the early part of this century, but German efforts to promote the diesel locomotive were hampered by World War 1.

After the war the Germans, the Americans and also the Russians (particularly the famous engineer Lomonosoff) explored the possibilities of the diesel engine for railways.

The cost advantage of the diesel locomotive meant that by the 1930s in the United States of America, in particular, widespread diesel conversion was forging ahead.

Record Breaker In Britain in the 1930s there was extensive electrification of suburban lines in the south of England, giving the most intensive electric train service in the world at the time.

But there was no such enthusiasm for diesel locomotives and, even after World War 11 when other countries were adopting modern forms of traction, steam locomotives were still being built in quantity in the United Kingdom.

It was not until the late 1950s that there was widespread dieselisation in Britain — although in the 1970s the British became world leaders in the application of diesel technology to high speed rail travel in the form of the InterCity 125 train.

This train, having travelled at 231km/h, is the diesel world speed record holder, and the technology involved has been exported to Australia, where the InterCity 125 has assumed the guise of the locally-built XPT.

Exporting Technology The XPT deal shows the way in which the British railway export trade has been moving — away from complete locomotives towards technology deals and the sale of the more sophisticated pieces of equipment for installation in locally-built vehicles.

British companies have, for instance, recently exported electrical equipment for use in south Korea, Brazil, Hong Kong, Taiwan and southern Africa.

Perhaps the technology incorporated in Electra will come to be used in this way — cementing its link with the Rocket as a British machine that has benefited railways in other parts of the world as well as its home country.

When it produced the InterCity 125 in the 1970s, British Rail became the world leader in the development of diesel locomotives. One of the countries to which the technology has been exported is Australia where the locomotive is known as the XPT.

bookshelf

Australia well covered in Janes

Jane's Urban Transport Systems
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In their foreword to the book the editors highlight the developing power of the market place on a universal level — and transport authorities are required to provide high frequency and fast services in a pleasant environment if they are to satisfy public demand.

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Janes Urban Transport Systems (1987) is not a cheap volume — it costs £74 in the United Kingdom.

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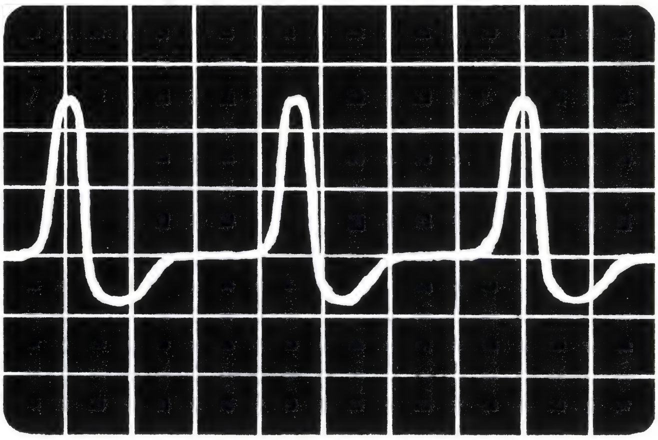

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Traction motors manufactured by Westinghouse will power new interurban rail cars for the NSW State Rail Authority.

SRA signs big traction motor contract

Sixty traction motors to power State Rail Authority interurban rail cars in NSW have been ordered from Westinghouse Electric.

The motors, manufactured under licence to Mitsubishi Electric Co, will be supplied to Comeng throughout 1987 and fitted to 15 new interurban rail cars.

Bogie mounted, the energy efficient motors are controlled by an electronic switching scheme which helps provide a smooth ride for passengers.

Production including full load and performance testing will be carried out at the Villawood NSW Works.

Motor specifications are: 130 kW continuously rated 1190 rpm insulated for 1500V DC Systems.

Meanwhile the Darra plant of Tyree Westinghouse, Queensland has secured a follow-on from Queensland Government Railways for Autotransformers.

A total of 180 ten MVA auto-transformers rates at 55 kV, are being progressively installed along the Gladstone to Blackwater to Mackay lines to enable coal to be hauled into port loading facilities.

A further 45 six MVA autotransformers have been ordered for the electrification of the main line from Gladstone to Caboolture.

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Caltex rail tanker being unloaded by Caltex employees — Westrail Sales Officer Tony Stratton views the operation.

Westrail wins Caltex fuel run

Westrail has won a $2.5 million contract to carry fuel from Fremantle to Geraldton for Caltex.
The contract allows for the Caltex rail tankers to make two return trips each week on the regular freighter. The first consignment reached Geraldton on April 30.

Westrail's Market Development Manager, Mr Eric Forte, said the new fuel business was part of a plan to carry fuel to all WA ports served by rail.
"We are already carrying Caltex fuel from Fremantle to Bunbury and are confident this scheme will also extend to other regional ports," he said.

"The winning of this business from ships proves that we are winning our battle of efficiency against other forms of transport," he said.
Mr Brian Brady, WA Marketing Manager of Caltex, welcomed the new agreement.
"We have been very pleased with the service to Bunbury and believe Geraldton will prove just as successful.

The "moving pipeline on rails" allows us to monitor fuel requirements as necessary and reduces the need for major storage facilities and therefore reduces our storage costs," he said.
The April 10 opening of Associated Minerals Consolidated's new $60 million synthetic rutile plant at Narngulu near Geraldton involves Westrail in three new and separate transport tasks.
It includes 186,000 tonnes of ilmenite from Eneabba (south of Geraldton), 65,000 tonnes of coal for Capel (near Bunbury), to be delivered to Narngulu.

After processing, the plant's output of 112,500 tonnes of synthetic rutile will be railed from Narngulu into Geraldton for shipping to markets in the United States, Japan and Europe.
The income will be a healthy $2.5 million a year for Westrail.
The plant is the biggest of its type in the world and orders have been placed for as much synthetic rutile as is produced for the next 10 years.

Westrail has implemented a programme to build in Westrail's workshops five new XEB wagons and modify seven WMD to WME wagons for this new traffic.
Construction has started at Midland on the prototype of 60 specialised narrow gauge 76 tonne (gross) wagons to be built for the grain fleet.

The aluminium/alloy bogie wagons are of a new design. They have a 29 per cent improved load-tare ratio compared with the previous best, the steel XVs.
They are also fully compatible with CBH facilities at terminals so as to minimise loading and discharge times.
All the research, development and design work was undertaken by Westrail's Mechanical Engineering Design Group at Midland.
Thirty of the new wagons will be ready for WA's next grain harvest. The remainder are due to be completed by June 1988.
Announcing the XU programme the Minister for Transport, Mr Troy, said the 60 new wagons would have a significant impact on Westrail's annual grain haul task.
They would contribute to a 30 per cent increase in overall wagon effectiveness (tonnes hauled per wagon) that would be achieved in the next 12 months.
Mr Troy said the new aluminium wagons would complement 30 XVs, also of 76 tonne gross, which were put into service for last season's harvest.
The aluminium wagons feature a design change which creates a greater payload capacity without increasing the length of the vehicle above that of the heavier steel design.
The extra load is carried lower down in the wagon and this improves the vehicle's stability.
Four air operated discharge doors actuate simultaneously in a sliding motion as a grate to uncover transverse slots through which grain passes.
The wagons have a 58 tonne payload capacity, about 13 tonnes more than the previous modern XWB narrow gauge wagons and about 17 tonnes more than some of the old wooden units.

Rail rules the Nullarbor

According to Westrail while some rail traffics are in decline, interstate freight is becoming the success story of the '80s.

The emphasis being placed on what is known as 'intermodal' freight is the key to success.

Significant increases in westbound tonnages have been recorded, so that rail now carries 70 per cent of freight crossing the Nullarbor.

The increases apply mainly to freight sent door-to-door in containers, but the railing of road trailers (piggybacking) is also popular.

Westbound rail freight, for the first time, exceeded one million tonnes last year and we expect to create a new record this year. Eastbound freight is also growing, and is now approaching half a million tonnes a year.

About 55 per cent of the total is generated by the freight forwarding industry.

The industry employs various modes but in recent times there has been a sharp move to containers.

In 1985/86, some 80 per cent of freight from the freight forwarders came to Perth in containers. This figure has now climbed by more than 40 per cent and growth is continuing.

More and more freight forwarders are making big investments in their own container stocks to give them greater flexibility through a door-to-door service.

Transit time is a key factor in intermodal operations.

The new Superfreighters (Westrail calls them The Westliner) have a guaranteed transit time of four days for Sydney and Melbourne freight.

A trial now under way may show it is possible to reduce the general freighters from Sydney to four days also.

Westrail's Assistant Commissioner Bruce Sutherland says intermodal operations are vital to the future of rail freight operations.

They provide rail with its best opportunity to win a freight market share from the road transport industry.

Mr Sutherland says the container service to Perth will be further improved in June when a modern intermodal terminal at Kewdale comes into operation. Kewdale is Westrail's interstate freight terminal located in Perth's metropolitan area.

High-speed unloading equipment at Kewdale will add to the efficiency of the system.

Meanwhile, further development of piggyback rail transport is being investigated.

The physical nature of the rail systems in NSW and Victoria are a drawback to door-to-door use of this system Trains coming out of Sydney and Melbourne need to pass through a series of tunnels and, as a result, height restrictions are imposed on rail load, Mr Sutherland said.

Meanwhile a unique Westrail project involving radio control of trains and self-restoring points is expected to dramatically improve train efficiency in the Central District of Perth.

The project will see the spending of about $700,000 on a limited radio network and motorised, self-restoring points in the heavily used Avon-Goomalling-Amery section.

Approval for the expenditure is expected shortly so that the project can be completed within two years.

Train operations on the narrow gauge lines of the Central District are currently controlled through telephone communications from the Train Control Centre at Northam and use the staff and ticket and electric staff methods of safeworking.

The major problem is that trains (and other track vehicles) must repeatedly stop to obtain authority to proceed from section to section.

This problem has recently been made even worse with the adoption of double length trains.

The stopping and starting of trains is costly for many reasons.

With the recent acceptance by train crews of the Train Orders system of safeworking, a solution is possible, using radio to communicate the orders to trains in motion.

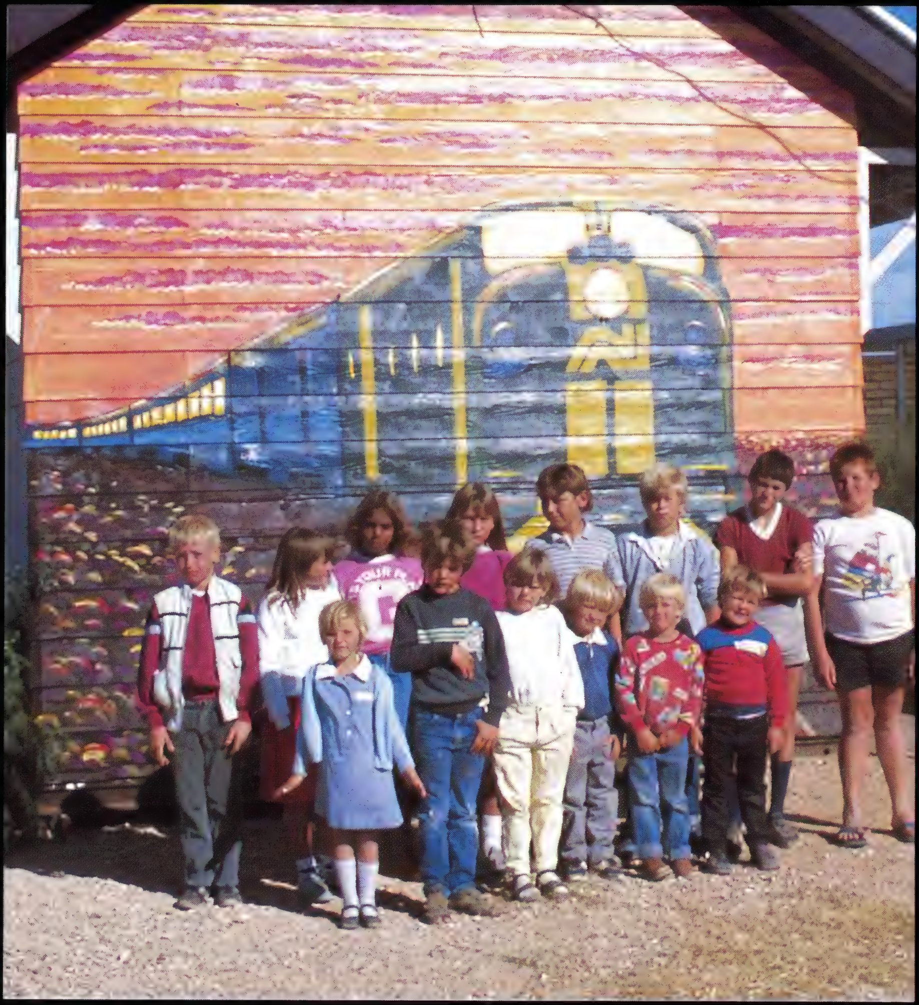
First, however, a radio network must be constructed, consisting of repeater stations strategically placed between Avon and Amery.

All locomotives likely to work this area are already equipped with radios.

To complement this use of radio for train control, a series of self-restoring points is intended to be installed to minimise delays to trains that now need to stop and lock up points after them as they pass through a junction or leave a crossing loop.

These new types of points will be operated by push-button controls at trackside to allow a train to enter a junction or loop. They reset themselves automatically after the train leaves.

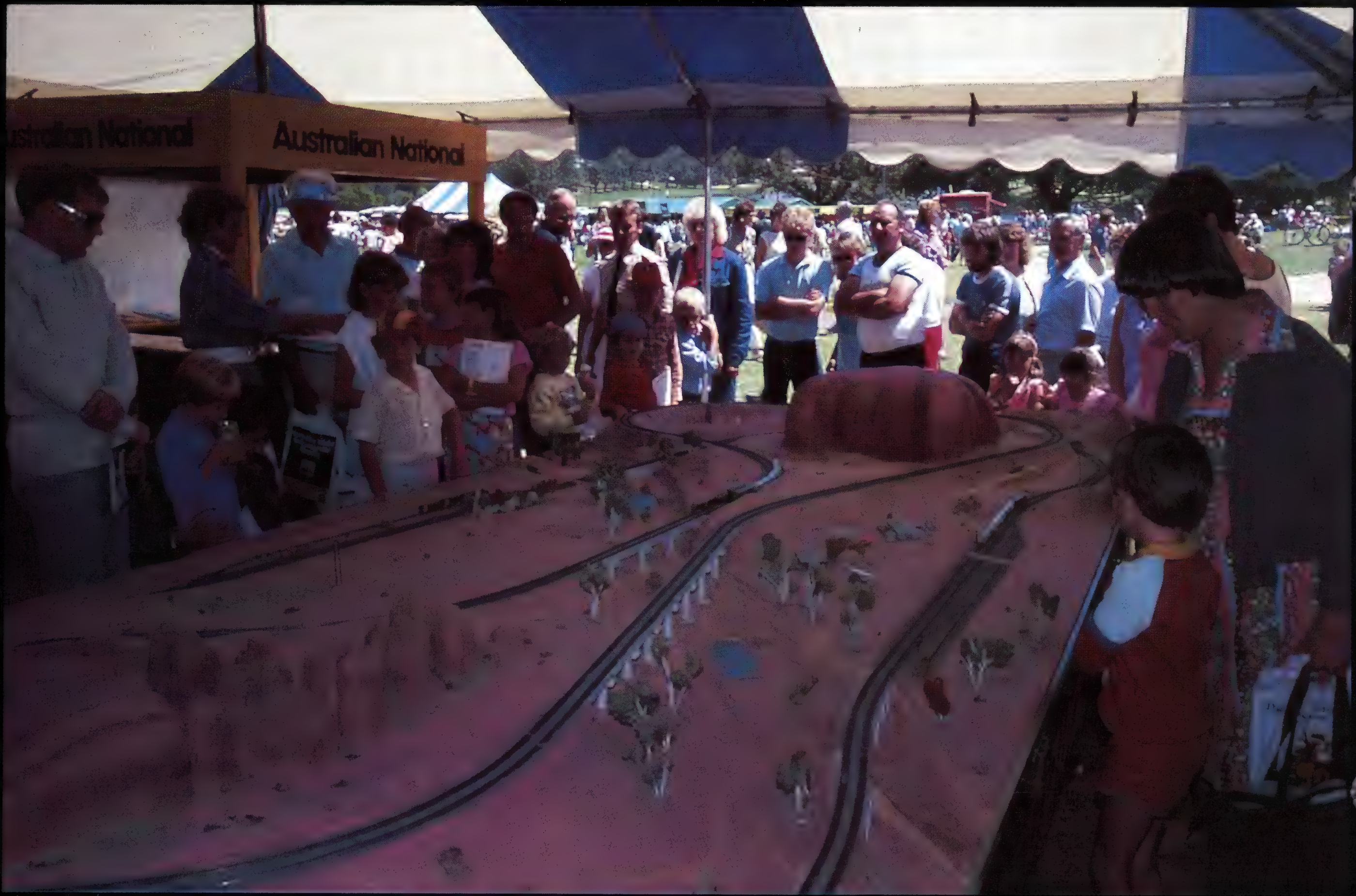
The present plan for the project leaves open the possibility of upgrading as new technology becomes available.

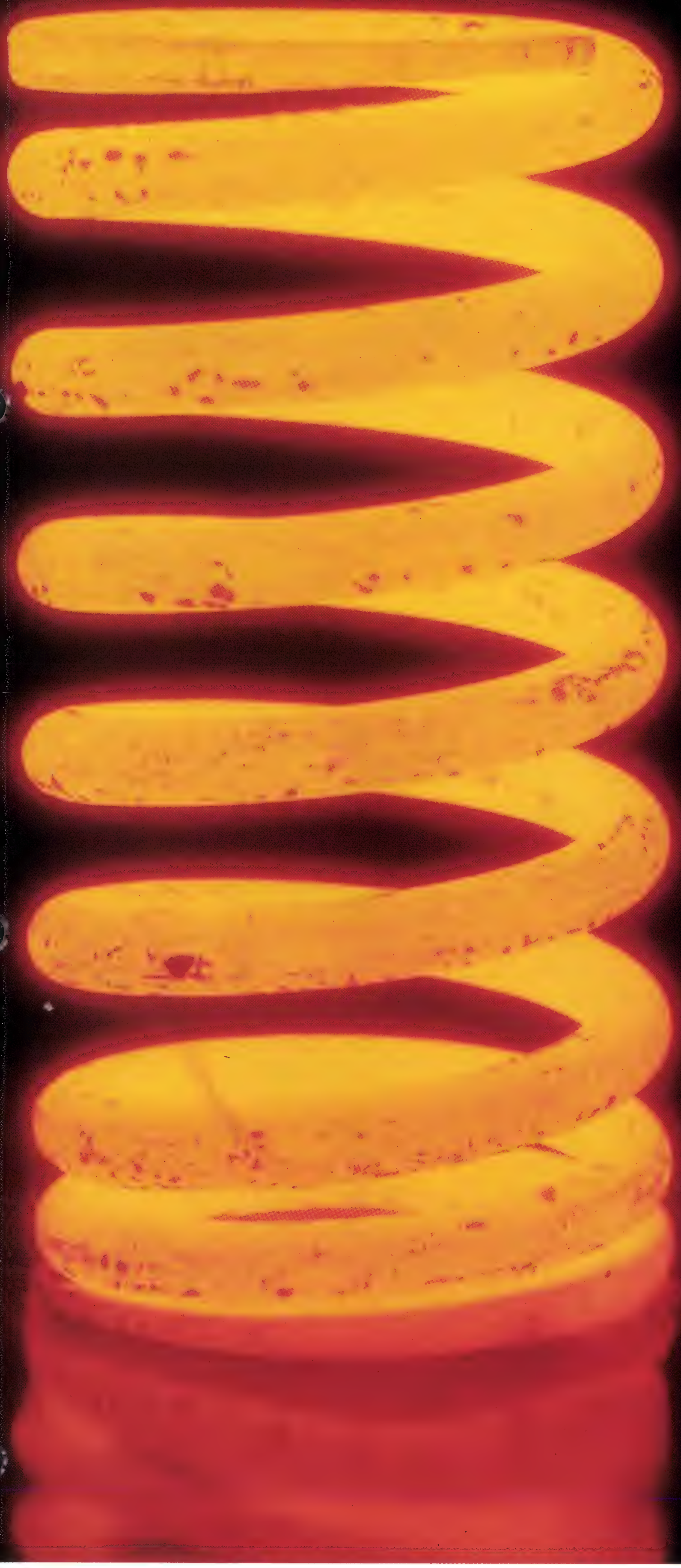


AN's brighter world for kids

Left: Murals depicting local environmental and railway interest have brightened the schools situated on Australian National's Trans Australian Railway at Tarcoola and Cook. Adelaide artist Ziggy Mos-Kwa designed the murals and spent two weeks on location painting them, assisted by the children of both schools. Cook schoolchildren are pictured in front of a mural of the Indian Pacific which attracts much attention from train passengers during the stop-over in the town.

Below: Large model railways depicting the Ghan and the Overland passenger trains drew large crowds when exhibited by Australian National at recent displays. Measuring 4.5 metres by 2.5 metres, the models were built at AN's Islington workshops by apprentices who also man and operate the models at displays. The Ghan model, featuring Ayers Rock, was part of a display used at the "Great Aussie Holiday Show" at Adelaide's Elder Park.





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‘A visi
SRA

This article by Pat Johnson, the new Chief Executive of the State Rail Authority of NSW, is based on a speech he gave recently in Sydney to the Chartered Institute of Transport (NSW Section).

I have a vision for the future of our railways in New South Wales, which I believe will lead State Rail through the current short-term market adversities into maturity as one of Australia's leading transport corporations.

That vision includes:

- a new approach to staff relations;
- a reformation of management;
- new approaches to business;
- improvements in operating methods
- an emphasis on utilising the latest rail technology; and
- continued capital investment.

Staff Relations

I have a very strong view that State Rail's future performance rests on its ability to effectively manage its human resources.

At management level I have initiated a performance review and development program.

I and my deputy chief executives have formed a board of management to provide direction for State Rail.

This board meets frequently, with the principal objective of reviewing all aspects of State Rail's performance.

I intend to leave day-to-day matters where they rightfully belong — with branch heads.

Each branch's contribution to the overall effectiveness of State Rail will be assessed on its achievement of pre-determined targets.

Branch heads, and in fact *all* employees, will be formally accountable for achievement of results through a Performance Review and Development Scheme (PRDS).

The scheme attemps to put a value on an individual's worth to an organisation.

Within State Rail we will review past and present performance and use that information to improve future performance.

The scheme will be supported by a unit which will review the efficiency and effectiveness of each part of the State Rail organisation.

This new unit (the Program Performance Review Section) should not be seen as some sort of "Corporate Policeman," but it will have formal auditing functions. Its principal role will be to help branch heads manage their areas of responsibility more systematically and, dare I say it, more "scientifically."

Any large Government Authority can offer no less to the tax paying community — on which it depends.

Our watchword now is "accountability management." Managers will be accountable for achieving results in key areas of their responsibilities, and their performance as managers will be evaluated accordingly. The evaluation will focus on the critical functions within each branch as well as managers' ability to manage human, financial and physical resources for which they are responsible.

All major changes place great stress on those who are involved, and very often it is our front-line people who bear the greatest burdens of stress.

For some years now State Rail has been in the forefront of enlightened staff relations which have provided:

- significant in-house management training, as well as training of front-line personnel in duties as diverse as the handling of public address systems, transport of the disabled, and preparation of food to cordon bleu level;
- a recruitment policy based on open competitive entry and Equal Employment Opportunity (EEO);
- an industrial disputes settlement procedure which sets guidlines for negotiation which has resulted in use of strike action only as a last resort; the effectiveness of this procedure, though severely tested by economic crises, has been apparent to all; and
- an EEO program which is seen by many as a model for large corporations, and which has yielded many Australian "firsts" such as our English as a Second Language program.

As Chief Executive I plan to ensure that the self-esteem, morale and attitudes of each employee are a major consideration of management. This will be of particular concern in those areas which have to deal with the often major changes forced on management by the introduction of new technology.

Organisational Change

As part of my commitment to greater organisational effectiveness, I have implemented changes in the organisation and reporting structure. The most important of these are:

- One deputy chief executive is now responsible for all engineering and operational (including marketing) functions.
- The other deputy chief executive is responsible for employee relations, administration, property, and legal matters.
- The director of finance reports to the chief executive as before, as do internal audit and corporate relations areas.
- There will be a new directorate of strategic development, reporting to the chief executive.

This director will be responsible for implementing the new initiatives dealing with corporate performance reviews, tightly controlling the capital works program, and strategic planning.

Those changes will be very important in State Rail;s long-term future.

New Approaches to Business

The new management team in State Rail realises that our organisation must compete on equal terms with other modes of transport in freight and passenger markets.

We realise that in many cases we must operate in de-regulated markets and

n for the future' says Chief Pat Johnson

that our operations need to be "market driven."

In many instances we are still saddled with legacies of uneconomic services as assets which must be divested.

In other cases we have natural advantages over other modes, and those will be built up.

For example, in the market for metropolitan rail passengers we have engaged an overseas consultant, Transmark, to develop and improve operating strategies for metropolitan train running.

This will encourage more and more people to use our trains.

One spin-off from that project was a major market survey of existing patronage, which provided very useful insights into the needs of our metropolitan customers. That work will be continued.

State Rail operates a vast network of country passenger services throughout NSW.

It will continue to do so because it provides the highest standards of safety and services at economical prices.

Our management realised that significant changes to Australia's wheat production, marketing and distribution systems are inevitable.

In anticipating those changes, State Rail has developed a policy that will reduce its wheat transport charges by 25 per cent over the next two years.

That will be achieved by

- improved efficiency that will contribute to a 15 per cent reduction in wheat transport cost; and
- a restructuring of the rail grain transport network, including withdrawal of services from some low volume branch lines, and introduction of a new wheat pricing system leading to at least a further 10 per cent reduction.

In the area of coal transport we continue to look for efficiencies to support our multi-million investment in the rail transport infrastructure of the coal industry.

(continued next page)

The "Tangara" suburban car, leading the world in train technology.

Main picture: The 81 Class locomotives are hauling bigger loads including planned 84-wagon coal trains.

Left: SRA's chief Pat Johnson flags out the XPT from the country train concourse at Central Sydney on the occasion of the fifth birthday of the train's introduction to NSW service.

(continued on page 41)

spectacular

A new railway tourist service, the Taieri Gorge Limited, made its inaugural run from Dunedin on February 21, 1987.

Departing daily (from November through to April) this scenic journey will appeal to Australians visiting New Zealand's South Island.

The railway through the Taieri Gorge on the Otago Central Railway is a spectacular route featuring numerous tunnels and high viaducts.

Many of the viaducts are supported by masonry piers similar to those seen supporting bridges in some parts of Victoria.

Passenger trains operating through the gorge are run by the Otago Excursion Train Trust which was established in 1979 by two Dunedin railway enthusiasts, Arthur Rockliff and George Emerson.

The trust purchased a number of old NZR carriages, built between 1915 and 1925, to form an excursion train.

The old carriages were completely refurbished.

Inside, they were fitted with modern chemical toilets, carpeted floors and a public address system.

The exteriors were painted in a distinctive yellow and brown livery.

One carriage was specially fitted out to sell refreshments and souvenirs.

The Otago Excursion Train (OET) soon became popular and since 1979 it has travelled throughout New Zealand.

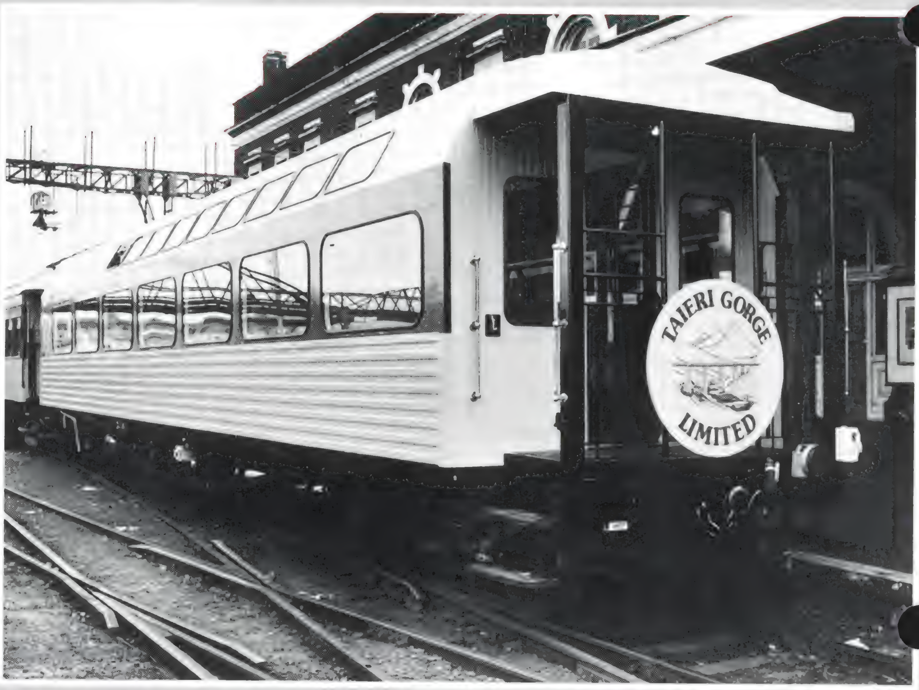
In June 1982 it made the longest-ever New Zealand railway journey when it travelled the entire length of the NZR — more than 2000 km — from Bluff to Okaihau, carrying delegates to the conference of Young Farmers Clubs in Northland.

However, the most popular excursions run through the Taieri Gorge near Dunedin.

On a number of occasions up to 500 people travel through the gorge as far as Pukerangi or Middlemarch.

Sometimes the train travels further along the Otago Central Railway to Alexandra, especially during the annual blossom festival.

The Otago Central Railway runs 214 km inland from Wingatui south of Dunedin. Its terminus is Clyde near the massive Clutha hydro development.



The new passenger carriage built by members of the Otago Excursion Train Trust. It was the first new passenger carriage built in New Zealand for almost 50 years. The Taieri Gorge Limited will eventually consist of three of these stylish vehicles. Photo: Roy Sinclair.

By Roy Sinclair

Until 1980 it went 19 km further through the Clutha Gorge to Cromwell but was closed as part of the preparations to raise the level of the Clutha River.

It took more than 40 years to build the Otago Central Railway.

Soon after construction began in 1879, a Commission set up by a Government running short of funds recommended that the railway be abandoned.

However, in 1881 a locally appointed Commission, comprising four Otago Members of Parliament, overturned the findings of the Parliamentary Commission.

Part of the reason to continue with the railway was to cut back on unemployment.

Few workers would have thanked those who supported the railway construction.

Conditions were harsh — especially in winter — and later, railway employees did not relish the prospect of being stationed in the isolated Taieri Gorge unless they were keen trout fishermen.

The railway served a large fruit growing area around the Clutha and regular passenger services ran between Dunedin and Cromwell until 1976. Currently, the railway is being kept open to serve the hydro scheme but since the deregulation of land transport in 1983 the scheme has been served mainly by road transport.

Only one goods train a day runs each way between Dunedin and Clyde.

New business has been brought to the railway through the privately-owned Otago Excursion Train. One keen supporter of the excursion train is Bob Hamilton who was once the NZR Assistant Traffic Manager in Dunedin.

He created interest in excursions to various Otago and Southland destinations during the 1950s. His excursions ran to such places as Queenstown, Milford Sound and Stewart Island.

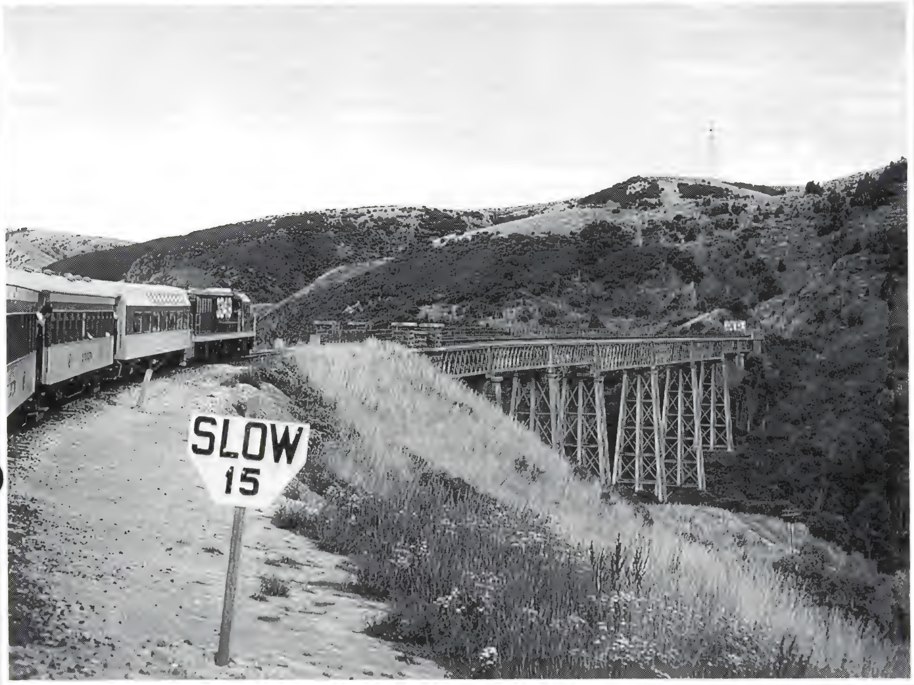
He chartered trains, buses, and even lake steamers to transport his excursionists. He was therefore delighted to receive an invitation for the inaugural run of the Taieri Gorge Limited.

A daily service was a bold step for the OET Trust.

However, the venture was launched after considerable preparation and it promises to become a major New

Taieri Gorge a . . .

The NZ Minister of Railways, Mr Richard Prebble, unveiling the Taieri Gorge Limited plaque before the inaugural run on February 21, 1987. Photo: Roy Sinclair.



The Taieri Gorge Limited about to cross Wingatui Viaduct on the return run to Dunedin. The new carriage is the first vehicle behind the Dj class locomotive. Photo: Roy Sinclair.

Zealand tourist attraction. — The Taieri Gorge can only be seen from the railway.

The Taieri Gorge Limited consists of three or four carriages and departs from Dunedin's magnificent railway station — itself a tourist attraction — at 3.30 pm.

It travels some 60 km through the gorge to Pukerangi and arrives back in Dunedin shortly after 7 pm. No bookings are required.

Passengers simply arrive at the station ten minutes before departure time. Tickets can be purchased on the train. Stops are made at various points of interest during the excursion. One favourite stopping place is the Wingatui Viaduct which stands 47 metres above the Mullocky Stream. Built in 1887, this was the first all-steel bridge built in New Zealand. Previously, such structures were built with wood.

After the successful construction of the Wingatui Viaduct, steel was used to build the major viaducts on the North Island Main Trunk.

Since 1887, the hillsides at each end of the viaduct have actually moved closer together and on two occasions a 30 cm section has been removed from the length of the structure.

Another popular stopping place is The Notches where the railway crosses four deep ravines between two high viaducts. The train stops on a ledge above the gorge and there is usually time for excursionists to climb above the railway to an old construction camp.

During the journey, passengers often prefer to stand on the open-platforms at each end of the carriages. Children, too, like to ride outside especially as the train goes through the numerous tunnels.

This practice is acceptable providing the children are accompanied by adults.

A set of new carriages will eventually run on the tourist service. These are being constructed by OET members and the first was ready for the inaugural Taieri Gorge Limited run in February. It is the first new carriage to be built in New Zealand for almost 50 years.

The carriages that run on all NZR services — except the Silver Fern — were built around 1939 from plans drawn by the NZR designing engineer, R. J. Gard who is best remembered for his stylish 4-8-4 K class steam locomotives.

His carriages are also stylish and they have been refurbished over the years. The NZR managers who travelled to Dunedin for the inaugural run of the Taieri Gorge Limited were most impressed by the new carriage. It is mounted on an existing frame and bogies and the cost of the all-steel construction was around $60,000. All materials were purchased in Dunedin.

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great NZR journey

(continued from page 35)

Inside, the new carriage is fitted out as a snack car. There is a buffet at one end and passengers sit around the fixed tables.

It has air-conditioning, extra windows near the roof to allow easy viewing of the mountain tops and one end has large windows so the vehicle serves as an observation car.

The old-style open platforms have also been incorporated in the design.

A second carriage with special facilities for disabled travellers should be running before the end of 1987.

The afternoon is an ideal time to take a railway journey through the Taieri Gorge.

The late afternoon sunshine enhances the already spectacular scenery during the return journey.

George Emerson says that since 1979 the Otago Excursion Train has proved that there is a real need to provide railway services for those people who just want a train ride without any particular need to travel.

I will always remember my first Taieri Gorge excursion. A male passenger in the seat opposite had obviously been persuaded to go on the trip very much against his will and he made no secret about it.

He had brought a good book with him and after showing it to those at his end of the carriage, he settled down to read the first page as the train waited to depart.

I lost track of him soon after the journey started but I noticed the book left discarded on his seat.

Later, as the train was travelling the last few kilometres back towards Dunedin he returned to the carriage telling everyone how great the railway journey had been.

I peered over his shoulder as he opened his book once more and noticed that he was still on the first page. I could not blame him for being captivated by the Taieri Gorge. It is, after all, known as the "Denver and Rio Grande" of New Zealand.

Left: The Otago Excursion Train at The Notches in the Taieri Gorge.

Photo: Roy Sinclair.

Giant load christens n

The opening of Stage 2, of Queensland's $1050 million Main Line Electrification programme, on May 29, 1987, consolidated the Sunshine State's rating as a world leader in heavy haul railways.

The 773 single track km of the Goonyella railway which comprises Stage 2 extends from the Blair Athol and Oaky Creek mines to the export coal ports of Hay Point and Dalrympie Bay.

Electrically-hauled coal trains also began regular service on the Blackwater Mine system, Stage 1, in May 1987. The first section of Stage 1, Gladstone to Rockhampton, came into operation in September, 1986.

The entire 2100km Main Line Electrification network, linking the Central Queensland coal mines with export ports and Brisbane will be capable of transporting huge stocks of export coal and freight well into the 21st century.

Electric locomotives are progressively being phased in on the coal lines from May, 1987 until mid-1989, when they will be hauling more than 1 million tonnes of coal each week.

Queensland Railways hauled 73.6 million tonnes of freight in 1985-86, a record for a Government railway in Australia.

Of this, almost 52 million tonnes of coal were railed for export from mines in Central Queensland.

The huge MLE scheme follows the introduction of electric passenger trains in the Brisbane suburban system in 1979.

After a feasibility study in 1980, the State Government authorised design work to proceed for Stage 1, Gladstone-Rockhampton-Blackwater, with the intention that Stage 2, the Hay Point-Coonyella system would follow completion of Stage 1.

However, the decision was taken in 1983 to proceed concurrently with Stages 1 and 2, which necessitated the purchase of 146 new electric locomotives.

At that time and prior to the introduction of electric traction all coal trains in Central Queensland were worked by diesel electric locomotives in two different consists, with remote-control operation.

Australia's longest ever coal train on June 3 christened stage two of the massive $1 billion Main Line Electrification Project in Central Queensland. With Transport Minister Don Lane at the controls, the 10,700 tonne, 156-unit (almost 2km) train broke the opening ribbon, commissioning the $333 million link.

It involves 773 kilometres of track connecting the coal fields in the Goonyella Mine system, including Blair Athol and Oakey Creek, with the export ports of Hay Point and Dalrymple Bay.

"Today's commissioning is a giant leap into the 21st century for Queensland Railways' operations in this state," Mr Lane said.

"With five of these huge 110-tonne electric diesels hauling 150 coal wagons, the payload, cost benefits and financial spin-offs are enormous.

"Stage two signals the start of huge savings in fuel and maintenance for coal haulage to export ports accompanied by vastly improved operating efficiency."

The opening ceremony by Mr Lane and the Commissioner for Railways, Mr Sheehy, took place in the 600-strong railway town of Coppabella, 160 kilometres south-west of Mackay.

Consist of electric Comeng and Walkers locos hauling coal wagons in track trials at Callemondah near Gladstone.

Blackwater diesel hauled trains (Stage 1) consist of five locomotives and 100 wagons, with a total gross train load of 7200 tonnes.

Goonyella diesel-hauled trains consist of six locomotives and 148 wagons with a gross train mass of 10,500 tonnes. These trains are about 2 km in length.

Several advantages of electric traction over diesel electric operation stood out in the feasibility study. These include:

- Higher availability of electric locomotives for traffic because of a 50% reduction in maintenance compared with diesel electrics.
- The potential to use locomotives of almost twice the power output (2900kW).
- The reduction in locomotive requirements of more than 20%.
- Faster turn-around times on upgraded track and hence a reduction in train crew numbers.
- The use of an indigenous energy source, coal rather than liquid fuel. Reducing Queensland Railways' liquid fuel bill by an estimated $50 million a year for all four Stages of Main Line Electrification.
- Reduction in locomotive maintenance costs of 40 to 50%.

Locomotives

Consideration of the design of the electric locomotives was based on the total requirements of a rapidly-expanding system.

Export coal traffic had been increasing from very humble beginnings in the early 1960s, when Queensland Railways commenced overseas — destined coal haulage in four wheeled VJM wagons with BEYER GARRATT locomotives with a train load of 650 tonnes.

Diesel hauled trains today in comparison are worked by up to six locomotives handling 10,500 tonnes.

Annual tonnage of coal hauled in 1980, both export and domestic, had reached 40 million tonnes and by

ammoth QR milestone

Official commissioning train, Main Line Electrification Gladstone-Rockhampton, September 6, 1986 (left) and Brisbane suburban EMU used in celebrations.

1990-91 this figure is expected to exceed 70 million tonnes.

The new 110-tonne electric locomotives are heavier than any existing Queensland Railways loco.

In order to achieve greater economies in operation, a detailed investigation was made into the possibility of increasing the axle load by approximately 12%, so as to increase tractive effort of the locomotives and reduce the number of locomotives required to haul each train.

This increase in axle load had to be achieved within acceptable limits in terms of track force and bridge loads.

This led to detailed study and adoption of a 3, 2-axle configuration Bo-Bo-Bo, in lieu of the 2, 3-axle configuration Co-Co, most commonly adopted for diesel locomotives.

The Bo-Bo-Bo arrangement reduced wheel wear and track force compared with the Co-Co configuration, and provides a more even distribution of weight, with lower bending moments on critical bridge spans.

The total of 166 locomotives (20 more than the original order) are being built for Main Line Electrification at Comeng (Queensland) based at Salisbury in Brisbane andd by Clyde/AASE-Walkers, 270 km north of Brisbane in Maryborough.

Estimated final cost of the locomotive fleet is almost $300 million. The locomotives develop 2900 kW of power at rail and operate from the 25 kW overhead supply.

Up to five locos (two up front and three in the middle) will haul trains of up to 10,500 tonnes comprising 148 wagons.

Thirty-nine command locos are being fitted with the microprocessor-based Locotrol system. This allows locos in the middle of a train to be remotely controlled from the lead command loco by radio.

Developments

Queensland Railways' electric locomotives will provide the motive power for one of the world's great coal export systems, the construction of which led to the resurgency of railway development in Queensland.

First of the major new lines was the shorter and more direct route between Moura and the Port of Gladstone, which was officially opened in March, 1968.

Its construction followed the signing of a ten year contract for coal from Moura, which had provided small quantities of coal for overseas consumption since June, 1962.

Spur lines were later built for the second and third export coal fields, Blackwater and South Blackwater.

The $200 million Goonyella-Hay Point Coal complex north of the Blackwater-Gladstone system opened in November, 1971.

It was based on the world's largest mineral contract (at the time) for 85 million tonnes of coking coal from Goonyella and Peak Downs.

This huge project included the opening of two major open-cut mines at Goonyella and Peak Downs; the creation of a $10 million new town, Moranbah; 200 km railway from Goonyella to Hay Point and a $32 million coal-loading plant and deep water port at Hay Point, 16 km South of Mackay.

Peak Downs came into production in 1972, and extra mines on the Goonyella system opened between 1974 and 1983.

These included Saraj1, Norwich Park, German Creek and Oaky Creek, Riverside and Blair Athol.

Associated with the opening of all these new mines was the need to construct additional new railways and the duplication and relaying of the Goonyella Railway, completed at a cost of $124 million in 1984.

This upgrading followed saturation usage of the single track operation between Coppabella and Hay Point as a result of increased tonnage.

Thirty coal trains daily on average now use the Goonyella system.

Expansion of the coal railway network since the early 1970s has extended beyond the Goonyella system.

Extra lines have been added on the Blackwater network to include Gregory (1979) and Currahg (1983).

In addition, Abbot Point — Collinsville — Newlands railway was completed in 1984.

Although coal traffic (Stages 1 and 2) provides the basis for Main Line Electrification, Stage 3 and 4 will make significant contributions to the operation of Queensland Railways.

Stage 3, linking Tolmics and Emerald in Central Queensland will cater for increased grain tonnages and is scheduled for opening in October, 1987.

Stage 4, between Brisbane and Rockhampton, will cut passenger travelling times by 40% and will increase gross freight loads by more than 50% to 1200 tonnes.

The first section, Caboolture to Nambour, is expected to open in April, 1988 and the Caboolture to Gladstone electrified link is timetabled for September, 1989.

(see picture next page)

Below: Overhead wiring installed on Stage 2 of Main Line Electrification Project by Citra Constructions Ltd.

Vision for the future - SRA Chief

(continued from page 33)

That includes re-examination of electrification in the Hunter Valley and coal railway lines around metropolitan Sydney.

At the same time we will continue to explore every commercial initiative that will support our customers' competitiveness in export markets. We have recently introduced 63-wagon unit coal trains, and they soon will be increased to 84-wagon trains.

New Technology

Railways throughout the industrialised world are experiencing a massive technological revolution, and State Rail is harnessing this ever-increasing technological change to the benefit of NSW.

In harnessing technology there is a special need to successfully manage:

- changes in staffing;
- training and re-training of staff to cope with the new demands of high technology;
- the involvement of unions at an early stage to enable a smooth transition to the new working environments created by "high tech";
- the new facilities, which are usually vastly different from the grimy old buildings they replace; and
- the installation of the new "high tech" testing equipment.

The ever-increasing list of breakthroughs in railway technology bears testimony to the rapid rate of change. The following examples are but a few in a list that could go on and on.

- Control systems are moving away from conventional hybrid mechanical/electrical (relay/rheostat) systems towards electronic ones based on the micro-processor and which are self-diagnostic.
- Our Tangara suburban electric carriages, which will start coming into service by the end of the year, have solid-state chopper thyristors.
- Our 81-class locomotives are equipped with control-creep tractive effort.
- Signalling/communications are now computerised.
- Dual-voltage traction requires specialised equipment and changes to our depots.
- Our communications systems statewide, for voice and data transmission are being extended and nodal computers for data transfer are being introduced.

There is also a "human face" to this technological revolution.

What is its impact on people within our organisation? How will it affect the quality of their work-life?

What tasks, occupations or skills might it make redundant? What disruptions might it cause to employees, and their families?

What consultative processes may be needed to reduce the fears of employees and minimise disruption when new technology is introduced?

And what operational methods and training will be needed to bring about successful application of the latest technology?

State Rail has attempted always to consider this "human face" of new technology in assessing its impact on employees, and ensuring the early involvement of management, employees and unions — especially in the conceptual stages of projects — where the need for changes is identified.

Before that was done, however, a union representative accompanied a study team of engineers that inspected traffic trouble and information systems overseas.

State Rail is also conscious that planning and consultation must include, in the early stages of implementation, training with a capital "T".

That training must cover operational aspects of new equipment, equipment servicing, and its maintenance.

Capital Investment

Since it commenced its operations on July 1, 1980, State Rail has spent the following amounts on the reconstruction of the NSW railway system.

	($M CURRENT)
1980/81	$245
1981/82	$286
1982/83	$324
1983/84	$402
1984/85	$421
1985/86	$422
TOTAL	$2,100

We will need to spend at least the same amount ($2,100 million) over the next six years or so, to maintain improvements already made to the system.

Most of that investment is in new technology and, therefore, it will cut costs and improve our efficiency.

Our capital investments have given us the XPT, vastly improved signalling through Centralised Traffic Control, modernised workshops, the Tangara suburban car (which will lead the world in train technology), and many other advances.

Structured for the Future

Formation of the State Rail Authority of NSW saw a major re-organisation of the railways to cope with ever-increasing competition in all freight and passenger markets.

The new structure helped us weather the economic crisis of 1982/83 in a way that would not have been possible before.

Our freight and pasenger areas were segmented to better cater for the needs of our customers.

We also recognised it was important to include our workers in decision making — including having them represented at authority meetings.

State Rail's childhood in adversity in the early 1980s gave it a strength of character to face the State's next economic crisis, which began in 1986 with a reduction in orders by overseas buyers of export coal and wheat.

This time the blows have been more painful because of the overwhelming dependence on export coal and wheat markets for our freight revenue

We are continuing to take initiatives to contain costs, but we are also looking at every way of increasing revenue from sources other than coal and wheat.

Our suburban passenger business continues to grow steadily as more and more commuters decide in favour of low-cost rail travel in their journey to work, and as the employment situation improves.

Unlike many pessimists, State Rail believes secondary manufacturing in Australia has a bright future — in replacing imported goods and as a potential exporter.

Our advisers tell us that the potential market for general freight is worth millions, and we are making every effort to exploit that potential.

We are rebuilding the NSW railway system to support our community well into the 21st Century, and despite our current short-term problems I believe State Rail has a great future.

AUSTRALIA JOINS

By Colin Taylor

In the Railway Gazette International there appears every two years a world-wide review of passenger train speeds according to the advertised schedules.

Japan and France have been fighting for the lead for the last few years, and only twelve different countries have merited a place in the league table over the twelve years that the review has been undertaken.

For a place in this roll of honour, a passenger train must have a scheduled start to stop run between any two stations on its route, of not less than 120 km/h.

Not a high figure but it is surprising that so few systems can produce trains that attain it.

Even more difficult is to sustain an equally high speed over the whole journey.

To attain 120 km/h between stops usually necessitates line speeds of 160 km/h or more and few trains achieve such an average between origin and final destination without some spurts of up to 200 km/h.

In the 1987 review, Australia proudly appears as the first representative from the Southern hemisphere.

In fact, it should have qualified in 1985, when the introduction of CTC between Albury and Wagga Wagga made it possible to slash ten minutes off the time between those places.

Network readers will be interested to know how Australian trains fare in the world speed league.

By and large our express trains are substantially slower than those in Europe and as yet we have nothing to compare with the Japanese Shinkansen or French TGV.

But speed is still important, to passengers and to management.

Speed increased have often led to increases in patronage.

The French TGV is the outstanding example of this, but SRA/NSW experience following the improvements in timing made possible by the XPT and by extended electrification, especially to Newcastle, confirms the principle.

For years, British Railways used the slogan "It's quicker by rail."

Westrail (and ROA) have long boasted of the **Prospector** as "Australia's fastest train."

Since there are only two trains in Australia which have reached the international 120 km/h threshold (the XPT and the Prospector) this review takes a lower figure, 100 km/h, as the threshold for inclusion in the "league table," but covers other interesting runs as well.

Fastest point to point, start to stop, run of all is the up **Riverina XPT** between Culcairn and Wagga Wagga at 129.7 km/h for 75.7 kilometres.

Two other runs at 120 km/h plus, on the same train from Albury to Culcairn and on the down service from Wagga Wagga to Culcairn, maintain the clear though not dramatic lead by SRA/NSW over Westrail's best **Prospector** performance, a 21 kilometre spurt at 126 km/h between Grass Valley and Meckering on Sundays, Mondays and Wednesdays.

The only other scheduled run in Australia at over 120 km/h is the 120.75 km/h of Friday's **Prospector** between Kellerberrin and Doodlakine. (For later developments see page 17 this issue of network).

Over seventy other different trains, or different runs of certain trains, fall in the 100 km/h plus range for speed between scheduled stops.

This is an important threshold in the Australian context, because 100 km/h is the legal speed limit on most of our roads and an advertised train which maintains the speed non-stop between two places must be seen as a potential challenge to the typical Australian love for the pampered pet known as the motor car.

In one European country there is a definite policy of upgrading lines adjoining main roads so that the trains can be seen to be faster than the cars.

Table 1 gives a summary of the fastest point to point runs on Australian rail at about the end of November 1986.

Westrail's **Prospector** and the **SRA/NSW XPT** fight it out between them but more conventional trains are surprisingly close to the first rank; the **Sydney Express** between Albury and Henty at 107 km/h (astonishing how all the SPIRIT stops have now been included in the schedule which actually improves on that of the former **Aurora!**), and the V/line Intercity 8318 which laps up the 66.8 kilometres between Wodonga and Wangaratta at a steady 100.2 km/h.

XPT south of Goulburn, NSW.

SRA/NSW does not hold its XPT honours solely because of the Albury service: the **Central West XPT** puts up a 106 km/h plus spurt in both directions between Paramatta and Penrith, not reaching comparable speeds again anywhere else on its route, although achieving a creditable performance on the reasonably straight alignments north of Orange.

Next nearest in the XPT league table is the Tableland service with just over 100 km/h start to stop from Wyong to Gosford.

THE SPEED LEAGUE

Turning now to overall schedules between origin and destination including stops, Australia has nothing in the 120 km/h plus league.

Only nine countries have so far crossed this threshold. Australia's maximum permitted line speed is only 160 km/h (compared to France's 270, Japan's 240, and Great Britain, West Germany, Italy, the Soviet Union and the USA — all 180 km/h or more.

Australia's fastest train is now the Riverina XPT on its down run from Sydney at 89.7 km/h for the 642.7 kilometres between Sydney and Albury, capping the **Prospector's** 88.4 km/h best on the Sunday to Thursday up run from Kalgoorlie by 1.3 km/h.

Before the advent of the XPT in 1983 the **Prospector** held the honours with 84.7 km/h runs from Perth on Fridays, but only after Vicrail two years earlier withdrew the 1228 Monday and Saturday Ararat Hamilton railcar which covered this 107 kilometre section at an overall 89.2 km/h.

The replacement bus does it in 95 minutes at more than 20 km/h slower. So much for bus substitution! New South Wales' fastest overall run, pre-XPT, was still on the Southern main line, where the 1501 Junee-Albury diesel put up a fairly creditable 81.2 km/h, but this was well matched by trains on Vicrail's Bendigo line.

It is somewhat salutory to recall that over a hundred years ago a Royal visitor was conveyed by rail 303 kilometres between Bendigo and Ballarat via Melbourne and Geelong at an overall 75 km/h. Overall, the mean speed of Australia's country, intercity and interstate passenger trains, of which there are 2265 every week, running to 734 different schedules and covering 535,790 kilometres in 9666 hours (an

(continued on page 44)

average run of 237 kilometres in 4 hours 16 minutes) is 55.43 km/h. Comparing this with, say the European TEE network in its heyday, with a mean over 36 different trains of 106.1 km/h, suggests that Australian trains are scarcely half as fast on average as the best of Europe.

This of course is comparing the Australian mean with Europe's best, which is misleading though interesting.

So far, we have not mentioned Queensland. This of course is a narrow gauge system, and it has more passenger services per head of population, and more passenger stations, than any other system in Australia.

Since for the purpose of this analysis, all trains which regularly include even one passenger carriage are counted as passenger trains — and Queensland still retains more mixed and "goods with passenger van attached subject to alteration or cancellation without notice" than any other state, it follows that the Queensland average is not only the lowest (a mean of 34.4 km/h) but is reduces the overall Australian mean.

Queensland's fastest passenger train is still the fortnightly Greenvale railcar at 58.9 km/h.

The **Sunlander** on its southbound run now notches up 48.8 km/h overall, a three and one half percent improvement on a few years ago.

Newest flagship, the **Queenslander,** further increases this to 49.9 in each direction — and it seems to go much faster when you are travelling on it.

The double heading of a 1700 and a 1500 class loco enable it to scale the taxing Eumundi ranges without its speed dropping below 40, whereas **Sunlanders** and **Capricornians** can drop back to 25.

The slowest train which carries passengers in Australia (barring tourist and preservation services such as **Puffing Billy)** is, technically, the Brooloo — Gympie goods on the Mary Valley line, since it is normally worked with passenger van, though unadvertised.

This maintains 13.25 km/h overall.

Five years ago the "Thangool Rocket" held the crown, an advertised service which averaged 11.25 km/h for its 179 kilometre run to Rockhampton. No longer is it advertised, and it has officially become two separate trains. Its six hour re-marshalling wait at Biloela accounted for its astonishingly low mean speed.

Queensland still, however, holds the record for the slowest "pure" passenger train in Australia, and with a named train too!

This of course is the now world famous **Kuranda Tourist Train** with its punishing 33 kilometre climb up the Barron Gorge in one and a half hours (22.2 km/h) — and no-one would reasonably want it to go any faster.

A never ending series of four to eight cabin curves on an almost continuous upward gradient cannot support the kind of service to seriously challenge the French or Japanese for the world speed record, but fifteen coaches regularly packed with upwards of three hundred passengers is nothing to be ashamed of!

TABLE 1 — Point to Point Runs at Over 100 km/h — December 1986

System	Train	Section	Distance km	Time mins.	Speed km/h
SRA/NSW	Riverina XPT	Culcairn-Wagga Wagga	75.66	35	129.70
	Riverina XPT	Wagga Wagga-Culcairn	75.66	36	126.10
	Riverina XPT	Albury-Culcairn	49.43	24	123.56
	Riverina XPT	Culcairn-Albury	49.43	25	118.62
	Sydney Express	Albury-Henty	65.96	37	106.96
	Central West XPT	Parramatta-Penrith/vv	31.88	18	106.27
	N. Tablelands XPT	Wyong-Gosford	20.17	12	100.87
WESTRAIL	Prospector	Grass Valley-Meckering	21.00	10	126.00
	Prospector	Kellerberrin-Doodlakine	16.10	8	120.75
	Prospector	Hines Hill-Doodlakine/vv	19.80	10	118.80
	Prospector (Fri)	Meckering-Cunderdin	25.10	13	115.85
	Prospector	Moorine Rock-Southern Cross	26.50	14	113.57
	Prospector	Cunderdin-Tammin	22.50	12	112.50
	Prospector	Jaurdi-Walleroo	36.60	20	109.80
	Prospector (Fri)	Hines Hill-Doodlakine	19.80	11	108.00
	Prospector	Meckering-Cunderdin/vv	25.10	15	107.57
	(Prospector exceeds 100 km/h on numerous other sections)				
V/LINE	InterCity 8318	Wodonga-Wangaratta	66.79	39	102.75
	InterCity 8305	Euroa-Benalla	44.22	26	102.05
	InterCity 8305/11	Benalla-Wangaratta	38.75	23	101.08
	InterCity various	Colac-Camperdown/vv	45.10	27	100.23
	InterCity 8311/26	Wodonga-Wangaratta/vv	66.79	40	100.18

Webb a Texan who left his mark on Australian Rail

By Dr Reece Jennings

(Adapted from an address given to the Australian Transport Conference, conducted by the Chartered Institute of Transport, South Australian Section)

I believe that most people involved in transport in South Australia — or even Australia — would be aware of William Alfred Webb and the railway legacy he left us.

Webb died in Dallas, Texas, fifty years ago and was given a State funeral.

In a way, the South Australian Sesquicentenary, or Jubilee 150 as we called it, was, last year a cogent reminder of his unique association with this State.

It is a matter for personal regret that although he is the only Texan with a direct and quite striking association with South Australia, we have been quite unable to get anyone in South Australia or Texas, our so-called Sister State, to do anything to officially recognise or remember him.

I also believe that most people involved in transport in South Australia know about the dramatic facets of the Webb years 1922-30, the 'big engines', the American rollingstock, the perpetual political conflicts, and so on. I am not going to deal with them. Instead I am going to discuss three important and little recognised aspects of the Webb years and in turn briefly relate them to the Australian National of the 80s, in an endeavour to show how astute a manager and administrator Webb was, and how he laid the footing for the remarkable activities of Australian National more than 50 years later.

The three facets are:

- Recognition of the established principles of economic railway operation.
- Accelerated introduction of technological change in train operating systems.
- Webb's efforts to improve efficiency, rationalise services and achieve commercial viability.

Recognition of the Established Principles of Economic Operation.

Prior to the arrival of Webb there was no understanding of the governing principles of economic railway operation but there was recogition that the South Australian Railways were in deep financial trouble.

In 1921 Commissioner James McGuire told a Parliamentary Committee that the greater the tonnage hauled from the Murray Lands Lines, the greater the loss.

Parliament had built the new lines as cheaply as possible with minimum-weight rails laid on unballasted, unstable formation.

The lines were not graded and simply followed land contours. None had even been surveyed before construction estimates were fixed.

The paying load per train was approximately 36 tons so that a large number of trains had to be run with resultant abnormal working costs.

Three Commissioners, Pendleton, Moncrieff and McGuire, found it impossible to convince successive governments that such construction and operational methods could not pay.

There was another factor, too, which was not recognised until many years later, and that was that Parliament's insistence on constructing branch lines through lands like those of the Murray, far from enhancing the value of the railway system and bringing social and economic advantages, had the opposite effect.

The work of Professor W. A. Sinclair and Phillip Plevin shows that ' . . . much of the expenditure on rural development in the first thirty years of the twentieth century was ill conceived from the point of view of its economic return'.

Plevin, in a scholarly effort in 1975 to make a quantitive analysis of railway investment in the Murray Mallee, concluded that it was reasonably certain that the short-run net economic benefits from the 531 kilometres of developmental railway were negative and the overall investment scheme enjoyed little success.

There was no hope that the Murray Lands Lines could ever have been economic propositions: we have had to wait sixty years for AN to accept this and do something about it.

Apart from this sophisticated economic analysis which was not dreamed of in the early years of this century when railway construction was synonymous with progress and economic development, parliament could never be convinced that it erred in building cheap and nasty lines.

The Commissioners, for their part, could not discern any axiomatic principles which governed the economic transport of freight by rail. But Webb did.

The whole basis of his rehabilitation scheme was to make the SAR as profitable as circumstances would permit by securing economical operation through the application of two basic operating principles:

- Obtaining the maximum net ton kilometres with a minimum tare tonnage.
- Getting the minimum train mileage with a maximum paying load.

It was in applying these two fundamental laws that Webb introduced the large, standardised freight car: the large motive power and the large freight train were merely inseparable components.

He was strikingly successful in reducing the tare to gross tonnage ratios of his goods stock, as the following table shows.

(continued from page 46)

Table 1: Number of Broad Gauge Freight Cars Pre and Post Rehabilitation, Tare Tonnage and Carrying Capacity

Year	Number of Vehicles	Tare Tonnage	Carrying Capacity	Tare/Gross Ratio
1922	3135	21287	37068	57 %
1928	1550	28150	58000	48.5%

The gravamen of this is that with less than half the freight vehicles previously in use, there is an increased capacity of 21000 tons, and a decreased tare/carrying ratio of 8.5%.

The rehabilitation also brought about a marked reduction in train mileage. Before 1923 freight train mileage varied with and was about the same as the total goods and livestock tonnage.

After the introduction of large locomotives and rollingstock there occurred a striking reduction of train mileage.

It is because Webb placed freight carriage on a modern scientific basis that the SAR survived another half a century to 1978, was able to cope with the demands of a war, and was able to hold together through those 50 successive years of political neglect, interference and mismanagement.

Webb himself had no delusions that he could ever 'Make the Railways Pay'. The political and economic climate of his time made that unattainable. He inherited a system where:

- For over fifty years no records had been kept of capital expenditure.
- There was not even a list of assets.
- No allowance had ever been made for depreciation, and steam locomotives fifty years old stood in the books at their original cost.
- Very little money was spent on maintenance.
- Construction and running costs were deliberately falsified at Ministerial direction to avoid parliamentary criticism.
- Capital funds were regularly diverted to revenue
- Loan moneys were used to pay wages and working expenses
- Huge amounts of loan interest were omitted from the balance sheets.

He was saddled with a huge 1065 km length of completely unproductive developmental kilometrage on the Murray and Eyre Peninsula lands.

For political reasons, line closures and rationalisation of services were quite unthinkable: regular freight and passenger services had to be provided regardless of profitability.

He wanted the railways to enter the road transport field, but the politicians sabotaged his plans.

His railway system was bound to the Common Carrier millstone.

He was expected to provide every form of public service regardless of its commercial viability. He had no control over freight rates which were kept at ludicrously low economic levels by the government.

He coped by introducing proper business and statistical methods; replacing steam passenger services where possible with railcars; catching up on deferred maintenance and insisting on the proper provision for depreciation.

We owe the broadening of the old Western system to him; the modernisation and complete reconstruction of the Islington workshops and train control and modern signalling methods, and it is to the latter that we now direct our attention.

Accelerated Introduction of Technological Change in Train Operating Systems.

The history of safeworking on the South Australian Railways to a large extent is the story of the change from English to American operating practices.

Interestingly, Webb did not initiate the first major change — automatic signalling. This was introduced by Charles George Pilkington in 1913.

It involved a contract to General Railway Signalling Company of America to design and install a GRS 2A system.

That Pilkington was able to take the giant stride from antiquated English Lock and Block to three position speed signalling was due, firstly to public and parliamentary disquiet over a serious collision at Gawler in 1907.

The most modern American signalling became the best bet for the Railway Commissioners.

Pilkington was the Assistant Engineer for Yards and Signals, and in 1923 under W. A. Webb he became the first Signal and Telegraph Engineer.

By 1919 principally because of the major civil engineering work involved in constructing the Sleeps Hill tunnel, Pilkington had got automatic signalling to Eden.

Nothing much else happened until Webb arrived. Then, between 1924 and 1926 it quickly spread to Tailem Bend, as well as other parts of the system, including some unusual places, two being Clare and St. Leonards!

Webb brought in the duplication Eden to Belair (1928) and Train Control in 1924.

All the preparatory work had been done by the brilliant Pilkington, under James McGuire, before Webb's arrival and the new Chief Commissioner would have felt at home with a signalling system based on the standard code of the Association of American Railroads.

It took Webb to terrify parliament into virtually giving him blank cheques, allowing him to press on with the extension of automatic signalling.

He invariably got his money by telling politicians that if they didn't hand it over, he would have to put men off and create unemployment. This is still a fashionable ploy today in the Arts — but not in the railways!

Worked with automatic signalling under train control from 1926-76, the South line was an efficient railway often utilised to maximum carrying capacity.

The line was put to the severest test during World War II: had it not been upgraded and had the benefits of the Webb total rehabilitation, including heavy rail and stronger bridges, it would not have measured up to the enormous transport task it faced as the key Australian system.

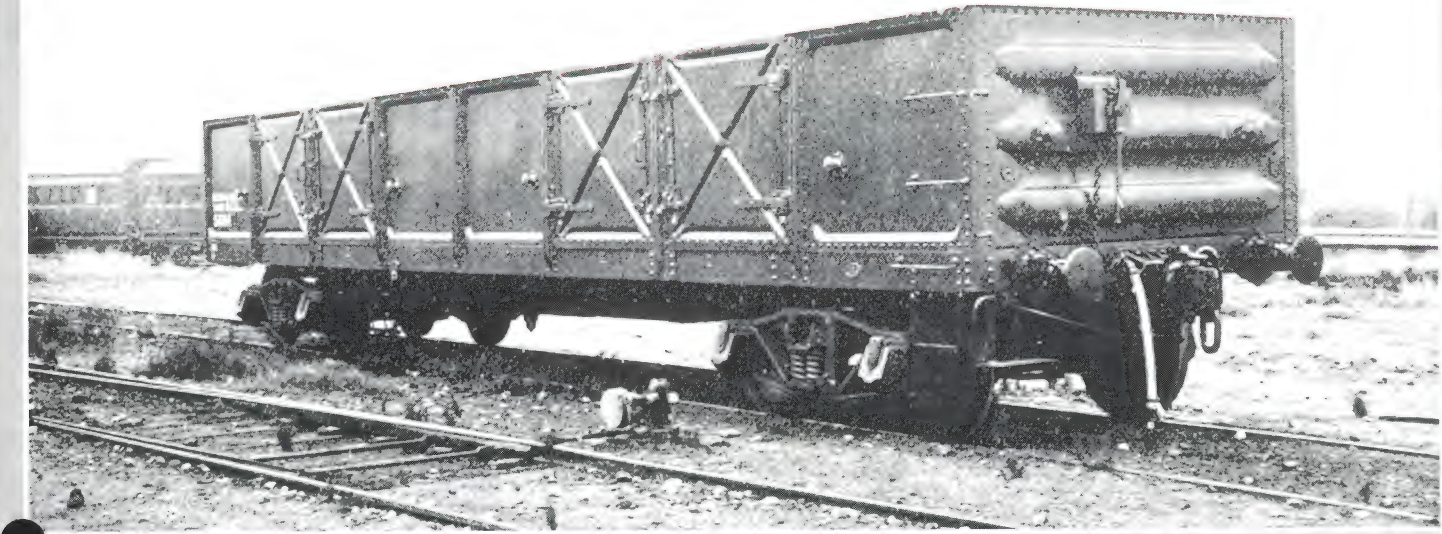
Now consider the financial benefit of the technological upgrading from Lock and Block and Electric Staff, to automatic signalling.

Up to 1932 the only serious research into railway signalling economics had been carried out by the Association of American Railroads.

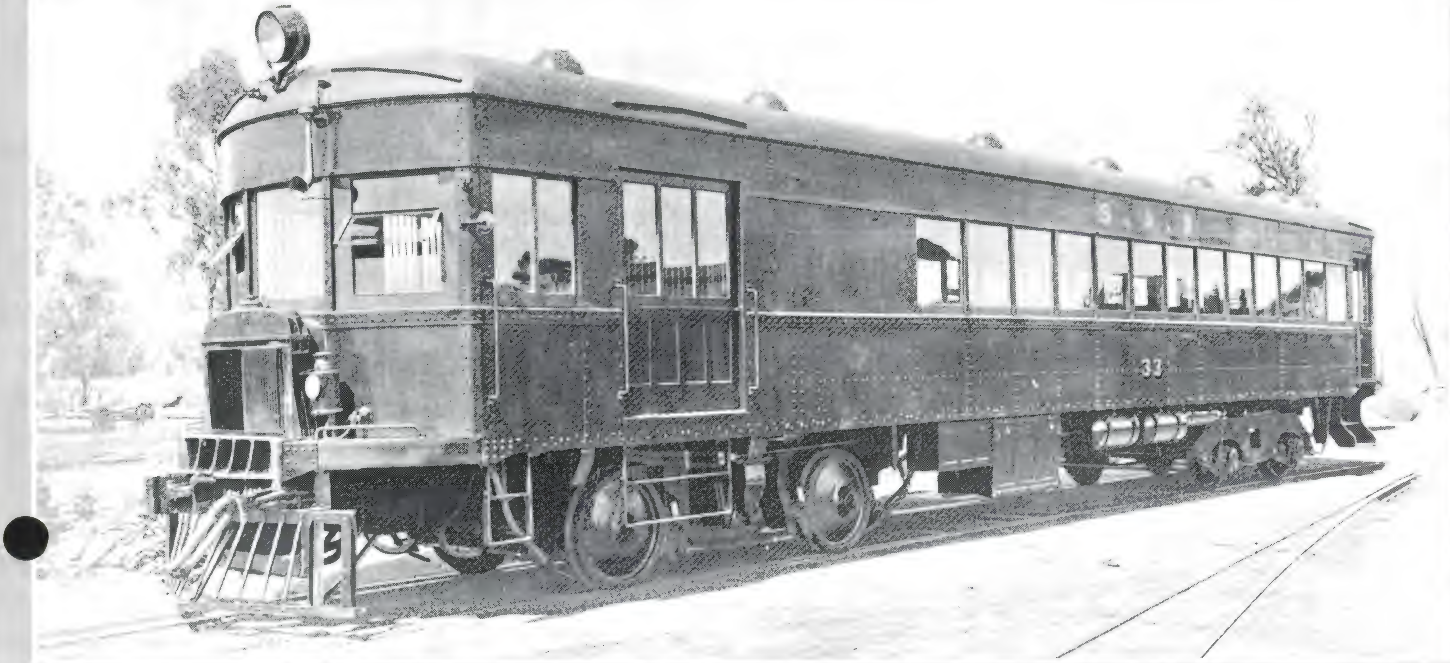
It was considered in 1924 that the average cost of a freight train per hour of running was US$19.25.

It is difficult to put a precise figure on the economic benefit to operating costs of a signalling technological change of fifty years ago because none of the day to day records of actual train movements have survived,

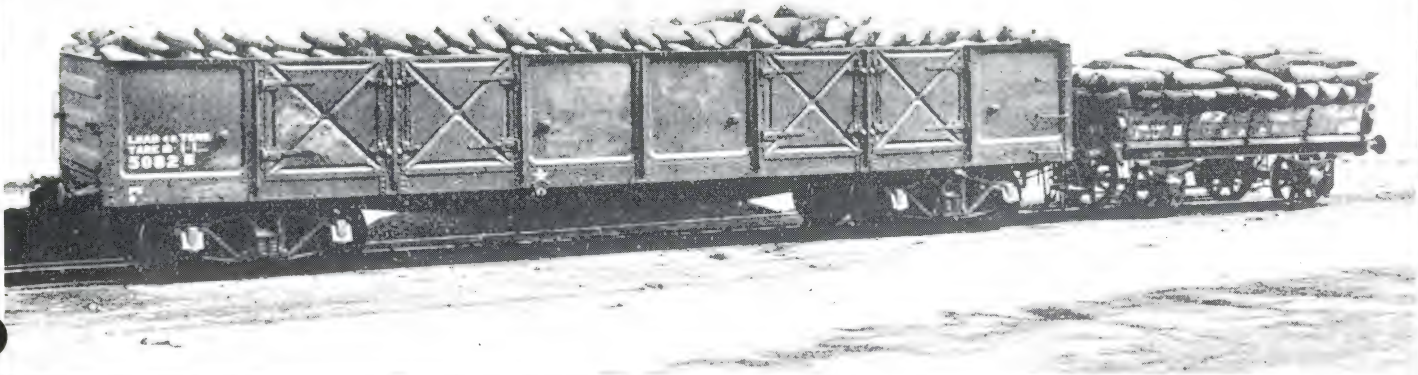
(continued on page 48)



All Steel Freight Car "Gondola" Type — 5 ft. 3 in. gauge, fitted with automatic couplers. Maximum rated capacity 44 tons. Tare 18 tons. Inside measurements of body, 43 ft. long by 8 ft. 8 in. wide by 4 ft. 6 in. high. Placed in service in 1925.



Rail Motor Car — 5 ft. 3 in. gauge. Length over body 56 ft. 8 in. Width over body 9 ft. 6 in. Fitted with baggage compartment. Seating capacity 65 passengers. Tare weight 25 tons. 6 cylinder engine 196 bhp. Built at Islington Works 1924.



Comparison between a later freight car, 5 ft. 3 in. gauge, and old Class J freight car. Maximum rated carrying capacity of the former is 44 tons, and of the latter 10 tons. The tare of the former is 18 tons and of the latter 5¼ tons.

710 Class Locomotive "Mikado" type — With train of 94 cattle cars and 1 Caboose car. Total length of train 3,779 ft. Total weight without engine 1,669 tons. Locomotive, cattle cars and caboose car built at Islington Works S.A.R.

but an attempt has been made to do so from indirect references.
One of the problems is that the period 1924-26 was a time of striking changes to traditional SAR working methods. The train control organisation was introduced in 1924.

Webb's high capacity bogie freight cars made their presence felt in about 1925, and his large power locomotives in 1926.
So the arrival of automatic signalling coincided with other important developments, not the least being the effect of the sudden implementation for the first time of the previously mentioned basic principles of revenue freight train operation — reducing gross ton miles by increasing full carload lots.

Prior to Webb the maximum motive power on the South line was the Rx locomotive which could haul 190 tons: the new 500B hauled 570.
It is interesting that even before the start of his radical changes, SAR operating statistics had begun to improve because of the application of efficient operating methods.

I have calculated conservatively that the effect of the savings achieved on the South line represented a return on the capital involved of 4.3% p.a. — significant for the line.
It is interesting to compare the economies of Centralised Traffic Control introduced in 1972 Tailem Bend to Wolseley to replace Electric Staff.
By calculating the number of trains saved per annum after CTC, and hence the number of train kilometres, the final figures show a saving of $561,348 per annum, representing a return of 43% on the investment.
CTC was first installed in Ohio, USA, in July 1927, a little too early for it to claim the attention of Webb.
It is interesting to reflect that when in England in 1934 a paper on CTC was read before the Institution of Railway Signal Engineers, nearly every participant bucketed the concept!

Webb's Efforts to Improve Efficiency, Rationalise Services and Achieve Commercial Viability.

Mention has been made of the introduction of Train Control.
It came into operation on October 6, 1924 between Adelaide and Murray Bridge.
For the first time one man could take complete control of the organisation and co-ordination of all activities incidental to moving of trains on any particular line. On February 16, 1925 it was introduced between Adelaide and Terowie and its extension over the entire system proceeded systematically and rapidly.
The Train Control system brought dramatic operational changes.
Passenger train running improved: freight train running time decreased because of reduced time spent in shunting, crossing or passing: crew hours were reduced: there was greater flexibility in the provision of freight trains.

Two interesting aspects which the introduction of Train Control brought to the light of day were, firstly, that before its introduction, every freight train did roadside work — after Train Control brought an overall picture of through and wayside tonnage offering,it became possible to allocate roadside work to one train only.
Secondly, the capacity of the South line was increased and duplication beyond Belair became unnecessary.
Between Adelaide and Murray Bridge in the first year of Train Control operation wagon loading increased by 7.33 per cent and there was a saving of no less than 772 full train loads.
When these figures are extrapolated to other important main lines (Adelaide-Terowie, Port Pirie-Cockburn, for example) the enormity of the financial saving becomes apparent.
Along with the pure American concept of Train Control went the Train Order system of Train Working. This was also an American system.
The first recorded instance of a Train Order sent by telegraph to vary a timetable crossing occurred in the United States in 1851.
The system became entrenched there: it never caught on in the United Kingdom where it generally was regarded as an extremely dangerous innovation.
The Train Order system as we know it — and its survival in South Australia for 61 years is, sufficient testimony to its safety and utility — started tentatively on June 3, 1925 when a 'Train Control Order' could be issued on permissive block territory.
Three weeks later on June 24, an 'Advancing Order' could be issued by train control on electric staff territory.
It was an actual authority for a train to proceed without an electric staff and its issue was envisaged when traffic officers were not in attendance at a station in advance, or could not be raised.
This, of course, reflects that fact that in those days there were few automatic staff instruments: the automatic instrument would have rendered an Advancing Order unnecessary.

Then on November 2, 1926 Train Order working in the form it more or less survives, with the specific round-ended signals, was brought in on the Victor Harbour line.

The principal incentive for its introduction was economic: staff could be booked off duty. Over the following fifteen years the system was gradually extended over all country lines with light traffic.

Along with Train Order working went the introduction of the familiar SAR 'Yard Limit' sign.

The first may have been erected at Robertstown Junction in 1927 when train order working was introduced Roseworthy-Morgan.

This began the process of getting rid of fixed signals — another economic legacy of the 1880s.

Train Order working is an efficient and sound safeworking system and when compared with Electric Staff on lines with similar traffic density, is more economical and less productive of operational delay.

Recently, I carried out a comparative analysis of daily delays to revenue freight train movements on lines worked by different systems.

Where there are up to nine freight trains per day train order working is superior to electric staff: beyond nine trains, train order and electric staff working had little to distinguish them, but the need for pole lines, batteries and continuous maintenance makes electric staff the more expensive system.

As a matter of interest it may be mentioned that CTC is incomparably more efficient than any system (except automatic signalling with short sections and many attended cabins — an expensive proposition).

On average, with the electric staff, eight trains per day will produce 425 minutes of traffic working delay each twenty four hours: on CTC territory a density of eighteen trains per day is needed before similar delays occur.

It was not politically possible for Webb to elimate country passenger services, so he early turned his mind to an alternative to the uneconomical steam operated trains.

In 1924 he obtained the first of the '55' class petrol rail motors which inaugurated large scale railcar operations in South Australia.

They were first put to work in July 1924 on the Murray Lands lines — Loxton, Waikerie, Paringa and Pinnaroo: with their introduction came one-class travel — second.

They survived into the 1970s and were the precursors of the Blue Birds of the 50s — still going strong.

There were many other aspects of the Webb years which have an important bearing on his search for economy, and mention will be made of a few.

In 1928 he brought in approach lighting of signals for the first time, and then had it extended.

In 1925 he introduced the automatic coupler — it was still being fitted on the broad gauge twelve years later!

The familiar block bell and block telephones also came in 1925, as did the track and block indicator relays with their red dumbells.

To eliminate the need for continuously attended stations he accelerated the introduction of automatic electric staff instruments, and on the main North line converted manually controlled electric signals to automatic. Keswick and Islington became the first of the semi-automatic signal cabins.

He eliminated crossing keepers by putting in 'Wig Wags' as quickly as they arrived from America. During his term, colour light signalling replaced Lock and Block between Bowden and Alberton and with the fifty per cent increase in efficiency went cabin closures: automatic flashing lights got rid of most crossing keepers.

He constantly applied technology to bring about operational or staff economies.

He stopped buying electricity from local Councils, or from station lighting plants, in favour of using mains power. This later enabled the use of accumulators, rechargeable from mains, to light signals — far more economical than batteries.

All over the system he got rid of oil and acetylene gas and installed electricity.

He was remarkable for his investment in people, too. He sent his officers overseas for experience. He founded the Railways Institute, started systematic safe working lectures and instruction, and was an enthusiastic proponent of first aid training.

It is impossible when you get immersed in the contemporary documents of the Webb era, not to experience the excitement, urgency and enthusiasm of those days.

After Webb left there was a further half century of stagnation which ended when the Dunstan government sold most of the SAR to the federal government and Australian National finally took over on March 1, 1978.

What is AN's debt to Webb?

Firstly, that there was a railway to take over, because there is nothing surer than that if there hadn't been that big Yankee, there would not have been a railway in this State after the last War.

Secondly, he alone laid the fabric of a modern railway — heavy track, strengthened bridges, modern operating systems, up-to-date workshops.

Thirdly, he put management on a proper business basis: new accounting methods, proper book-keeping, elimination of the inefficient and redundant.

He reorganised and decentralised an administration which had become constipated and lethargic. Above all, he along recognised those basic principles of obtaining the maximum net tonne kilometres with a minimum tare tonnage, and getting the minimum train mileage with a maximum train load.

The major part of his rehabilitation was directed to this end — the large power, the boosters, the big trucks, train control, signalling and modern communications.

I suggest that Australian National has achieved its remarkable success by following Webb's principles and precepts. It has applied those basic principles with a vengeance.

It has not only shed redundant staff, it has accomplished the miracle of political independence and even freed itself from the Common Carrier burden.

Its standardisation has been stunningly successful and we have even seen duplicated track in South Australia! The extraordinary efficiency and managerial expertise of AN is reflected best of all in a study of its main line train operations.

After CTC was introduced between Tailem Bend and Servicetown in 1972 there were striking changes in all the parameters by which efficient railway operation is measured.

Train hours declined; train speed increased, as did average net load and annual net tonne/km. More significant still is that when AN took over, there were dramatic improvements in every one of the basic statistics — for a virtually constant annual train kilometrage.

The future lies with AN, and given the groundwork laid by Webb, it will achieve what has been unattainable for 124 years: commercial viability.

That's what its all about.

Record breaking Coal Train by SRA using 4 Clyde 81 Class Diesel Electric Locomotives, pulling 84 wagons - gross 8,400 tonnes.

In February 1987, Clyde Engineering will supply its 2 millionth horsepower to Australian rail roads.

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Big spending boos

by John Petty,
Transport Correspondent,
"The Daily Telegraph," London.

A surge of new investment worth £2500 million over the next five years is planned by British Railways, with a revitalisation of its network scheduled, including extended electrification, faster trains, more automation, opening of many new stations and a range of bargain fares to encourage off-peak travel.

It is a great change from the 1960s when the system was severely curtailed in an effort to save money. Now some of the stations and routes which were closed then are coming back into use.

And all investment is coming out of BR's own resources. It is perhaps the least subsidised of all the major railway networks of the world, yet only Japan can challenge it for the intensity of services provided.

BR is now making a profit. This has been achieved despite having its state aid reduced by 25% since 1983, with a further 25% of the subsidy to be ended over the next three years.

No Subsidy

The subsidy, known as "the public service obligation," is provided by the British Government to keep open routes that BR would otherwise close on purely commercial grounds.

'Closed stations and routes to be reopened'

Once it was almost £1000 million a year but it is now down to £712 million for the financial year 1986-87 and it will shortly fall to £550 million a year.

This is being achieved without any big alteration to the amount of track in use and with services being increased and improved on many lines.

Express services will soon be paying their way and have no subsidy of any kind. Some are run by electric trains and others by the world's fastest diesels which out-pace even the famous "bullet trains" of Japan.

A fleet of new electric locos has just been ordered from Britain's GEC, and these will cruise at 224 km/h in regular service on the London-Leeds and London-Edinburgh routes, now being electrified at a cost of £306 million.

It is part of a whole series of electrification schemes which will soon increase the proportion of Britain's electric services from one-third to a half.

The schemes cover many areas including London-Cambridge and London-Norwich in eastern England, Glasgow-Ayr in Scotland, Merseyside in northwestern England, and Tonbridge-Hastings and Bournemouth-Weymouth in the south.

New coaches are being developed as well, with some designed to tilt to avoid trains slowing down at curves in the track when being hauled by the new high speed locomotives.

New Standards Of Comfort

Rural and urban routes are also getting new trains. The most lightly used lines are getting "railbuses" of lightweight construction which will be easy to maintain, will have low fuel consumption and be much cheaper to build and operate than older models.

They have been developed jointly by BR and the Leyland Bus division of Rover.

Lines serving a greater population, both urban and rural, are getting newly designed diesel-powered Sprinter trains.

They are bringing new standards of comfort to passengers and their rapid acceleration is reducing journey times.

'British Rail is now making a profit'

They, too, need far less maintenance than the older diesels which they replace. Modern technology is bringing a dramatic decline in costs while attracting many extra passengers.

The biggest spate of new train orders ever known in Britain is in progress. Some are coming from BR's own workshops and others from private manufacturers such as Metro-Cammell and Leyland Vehicles. As they enter service there is a gratifying increase in customers.

On some lines the number of people travelling has gone up by one-third, while individual stations have in some cases more than doubled the number of tickets sold.

The problem, as in other countries, is that most traffic is in the short periods when commuters make their daily journey to and from work.

Filling the off-peak trains is what makes all the difference between profit and loss in operating a railway.

Cardholders Travel More

BR has a series of special railcards which are bought annually and offer discounts when the holders buy off-peak tickets. In most cases the discount is one-third off the normal price.

There are railcards for families, for the elderly and for young people.

There is also one in southeast England available to anyone who travels after 10.00 hours or at any time at weekends.

$A6000 MILLION ALLOCATE

set to revitalise BR

Most of these railcards cost £12 a year. So many are being sold that BR gets a big income from them. And the holders are using trains far more than they did in the past, so the fare discount is soon translated into extra income for the railways.

There are also off-peak Saver fares for casual trips made by anyone. These fares vary enormously, depending on how heavily loaded off-peak services are on individual routes.

The saving to the user is more on a lightly used route than on a relatively busy one.

All this means that far more people are passing through stations all day long. That means stations are becoming very attractive trading centres for shopkeepers.

So BR has embarked on an extensive property development programme, with stations being converted into shopping centres as well as places at which to board trains.

Private Partnership

The latest idea is to use them as places where cars can be serviced and repaired.

Passengers leave their cars in the station car park in the morning and collect them the same evening with the work completed. This is another franchise arrangement.

BR provides the site and controls both the standards of workmanship and prices charged for work on cars.

> **'Express services are paying their way'**

Companies in the car business pay BR for the privilege of using the sites. In many towns and cities BR is in partnership with property development companies.

It provides the site and a private enterprise property company then rebuilds the station with an office block above it.

So BR gets a new station free, along with a share of the rents charged by the property company to tenants of the office building.

It is deals of this kind that enables BR to plan so much extra investment without recourse to the taxpayer.

One of the biggest development schemes will cost over £300 million with the rebuilding of Liverpool Street Station, linking the City of London with a large part of eastern England.

The basic cost is to be met by the property developer.

BR will not only get a major new station out of it, but also the finance to redesign its track layout for many kilometres beyond Liverpool Street.

Other schemes allowing it to rebuild its stations and open new ones include persuading local communities to take a wider interest in their railway. In some areas, volunteers have organised fund raising for a new station or modernisation of an existing one.

Sometimes the same people are so enthusiatic that they also do some of the actual rebuilding work themselves.

Restoration And Preservation

Companies are being invited to "adopt" the station nearest to their head office. In exchange for a cash contribution, the station is painted in colours associated with the firm.

Special boards go up on station platforms, identifying the company.

A typical sign reads "Godalming, home of Friary Meux," which is the local brewery.

A Railway Heritage Trust has been set up which also provides money to help restore and preserve stations as well as other railway buildings of particular interest.

> **'The pace of investment the best ever known'**

In some places, local organisations brighten stations with hanging baskets filled with flowers and by cultivating gardens on platforms.

Ever more local authorities are also joining with BR to supply money for the opening of new stations or the refurbishment of old ones.

Nor is that the end of the tale.

The railway trade unions are playing their part by agreeing to end many restrictive practices in order to curb costs by improving productivity and efficiency.

So the size of train crews is being reduced and so is the amount of staff needed at stations.

There are many technical advances, such as the introduction of radio signalling on country routes and the replacement of manned level crossings with automatic barriers activated by the approach of a train.

Pace of Investment

There are also vast changes in track-work, with new equipment and methods taking much of the hard labour out of the job while speeding the completion of each task.

Overall, the pace of investment is by far the best ever known on British Railways.

Once again BR is in the forefront of railway technology and providing advisory services to many other nations.

Which is at it should be, since it was Britain that first gave railways to the world.

TO BOOST RAIL UTILIZATION

1

Contest a world first?

The world's first rail tracklaying contest, staged by State Rail in Sydney at the Royal Easter Show, was such a crowd-pleaser it will become an annual event.

It attracted close to 2,000 spectators at each session.

The inaugural Superfreighter trophy for the event was won by a Coffs Harbour team.

State Rail's chief executive, Pat Johnson, presented the trophy and said he expected teams from other States would compete for it at next year's show.

The 12 competing teams were Coffs Harbour, Katoomba B (runners up), Katoomba A, Newcastle, North Star, Narrabri, Metropolitan A, B, C and City, Lithgow/Bathurst, and Wagga Wagga.

The Coffs Harbour team was Peter Tarrant (Coffs Harbour), Graham Supple (Kempsey), Peter Cook (Wauchope), Ken Black (Urunga), Mark Condron (Coffs Harbour), and Martin Madden (Macksville).

Team Supervisor was Bob Petch.

Coffs Harbour set the new world record time of 19 minutes 54.15 seconds in a semi final; their grand final time (corrected) was 20 minutes 5.99 seconds.

The team had not worked together before this year.

In the contests the teams of six and a supervisor/coach had to lay 12 metres of track against the clock.

Four six metre long rails were laid on plates, bolted and spiked to 20 pre-bored wooden sleepers.

Incorrect work resulted in time penalties.

State Rail's show exhibit this year received a "Commended" award.

It featured six metre high, three dimensional scenes of the outback, mountains and beaches, waterfalls and rock pools and a running stream for gold panning.

Damper-making displays, a State Rail supercoach and sample bags were also features.

(Numbered pictures show order of progress)

3

4

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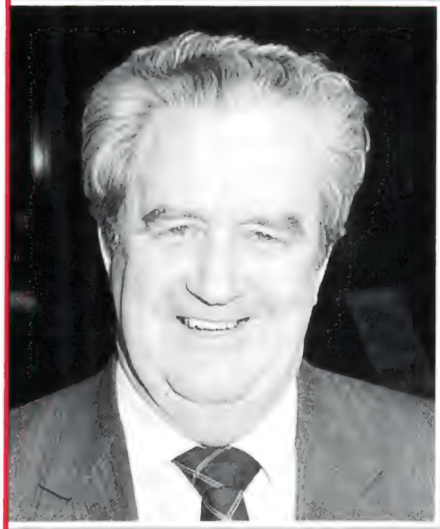

New Chief for State Rail Authority

Mr Pat Johnson is the new State Rail Authority of NSW Chief Executive. He was an official of the Electrical Trades Union for approximately 15 years; rising to the position of Assistant Secretary of the New South Wales Branch.
In 1969 he was appointed Conciliation Commissioner under the provisions of the Industrial Arbitration Act of New South Wales and was in the position for approximately 10 years.

On July 1 1980 he was appointed Deputy Chief Executive, State Rail Authority of New South Wales.
As Deputy Chief Executive, he was a member of the State Rail Authority of New South Wales, the Urban Transit Authority of New South Wales, the Ferry Advisory Board, the Railway Workshops Board, Transport Investigation Advisory Board and Property Advisory Board of SRA
He is Chairman of the Inter-Departmental Level Crossing Committee and the Authorities' Director of Affirmative Action.

Mr Johnson is a foundation member of the State Rail Authority, and has had the responsiblity for implementing the various reforms of work practices which have resulted in significant reductions in operating expenditure.
He is a member of the Standing Committee on Employee Participation which advises the Minister for Industrial Relations and Employment. He is Chairman of Directors of the Royal North Shore Hospital and Area Board.

Mr Johnson is married with three grown up children. He describes himself as a "Balmain boy who doesn't cry" but now lives on Sydney's North Shore, while remaining a staunch "Tigers" supporter.

Symposium

A symposium on "Performance of Urban Public Transport" is to be held at Monash University August 19-21, 1987. It is being organised by The Department of Civil Engineering. The Department claims the performance of public transport systems is under critical examination from all sides.
Performance needs multidimensional assessment, including considerations of technology and information, planning and provision of services, operational eficiency and effectiveness, industrial and community relations, financial performance and management, and satisfaction of traveller demands.
Public transport is essential; what can or do we have to do to ensure it is viable, relevant and useful?
Further details are available from Dr M. A. P. Taylor, Dept. of Civil Engineering, Monash University, Phone (03) 565 4959.

'Sentinels of safety,' . . . a few observations

Dear Sir,
A few comments on your Article "Sentinel Part 3" in April/May/June 1987 Issue.
There are several statements I must query.

"Technical Checkout"
"There are no insulated rail joints (Mount Newman in the Pilbara)" I would be very interested to learn how the many hundreds of track circuits on M.N. Railroad operate without insulated joints.
"Today's signalling costs typically 15-20% of a new electrification Scheme." I would like to know exactly what other costs are or are not included to bring the signalling content to 15-20%.

The Future
"Traditional electro-mechanical ironmongery, thousands of relays, with gold-tipped contacts and hundreds of kilometres of costly wire with individually soldered connections."
I assume the writer is referring to signalling relays but to my knowledge, there are none in Australian Railways which have gold tipped contacts.
The usual specification is for silver to silver impregnated carbon. Individually soldered connections have not been used on Australian Railways except perhaps for emergency repairs for many, many years.
Apart from this, the Article was both interesting and informative.
Yours faithfully,
WESTINGHOUSE BRAKE & SIGNAL CO. (AUST.) LTD.
I. F. Ritchie
GENERAL MANAGER.

Westrail closure at Geraldton

Westrail has decided to close down its operations in Geraldton.
In a move reminiscent of Bunbury two years ago, Westrail is to relocate its locomotive and wagon depots, and the civil and signals depots at a site now being evaluated at Narngulu, 13 km away.
The Government will provide roughly $8 million for the relocation and has set the target of October 1988 for the job to be completed.
After that, most of the existing Geraldton buildings and track will be removed and the land made available for community and commercial development.
Only the station and adjacent road coach facilities, as well as a single main line to the port, will remain.

Westrail's Assistant Chief Civil Engineer (Works), Mr Bob Dean, who is a member of the relocation planning group, says Geraldton townspeople have pressed for some time for the railway yards to be redeveloped.

The great decline in yard activity and changes to traffic working had lent support to the town's case.

' The old-style concept of the railways being the focal point as the town grows around us is being challenged for environmenal reasons,' Mr Dean says.

The move 'out of town' has been completed at Bunbury and is now also being investigated for Albany.

As long as Westrail is not inconvenienced operationally, and is compensated for the cost of moving, Westrail will not resist requests to relocate.

'In Geraldton, the main need is for good access to the port, and this will be provided in the relocation plan.

Now that the decision has been taken and the money made available, planning of our move is going ahead quickly.

'We have identified a suitable site and purchase from the private owner is being negotiated,' Mr Dean says.

Visit to Ho Chi Minh City

One of the most unusual assignments ever undertaken by a member of Westrail will begin soon in Ho Chi Minh City.

Westrail's Chief Chemist Neil Hammer is going to Vietnam with a United Nations project team to help upgrade the country's railway maintenance programme.

Neil is taking two months leave of absence to work in the Chi Hoa Locomotive Works in the city that was formerly Saigon,

His task will be to set up a laboratory testing programme for fuels and oils to improve diesel locomotive maintenance.

He hopes to achieve a programme similar to the one used by Westrail, but will face the dual hurdles of insufficient instrumentation and a lack of experienced local staff.

'Westrail's sophisticated oil testing programme becomes almost like a fingerprint for each individual locomotive,' says Neil.

We use it to effectively set up preventive maintenance schedules rather than repair maintenance.

This will be my aim in Ho Chi Minh City but at the same time, I know I must be prepared to work at the most basic technical level.

'For example, sampling procedures are crucial to any programme of testing and its likely I will first need to establish sound sampling procedures'.

The overall objective of the United Nations project is to train technicians in service and maintenance procedures so that enough locomotives of the Fifth Company of Vietnam Railways can be kept in reliable full-time operation to meet current traffic demands.

Neil says the main railway system extends more than 1700 km along the spine of Vietnam from Ho Chi Minh City in the South to Hanoi in the North.

There are another 700 km of feeder lines from the ports and high country.

During the war, the railway was a "vulnerable and frequent target," according to Neil.

Neil says the Fifth Company has 45 General Electric 900hp diesel locomotives (of which 10 to 12 are in operation), six Plymouth and 10 Alsthom 850hp locomotives, now essentially out of service.

Some of the experienced workers who received training during the 60s, when the diesel locomotives were received, are handling most of the maintenance. But they are few and have little time to train others.

There is, therefore an acute scarcity of mechanical and electrical skills.

Australian National Commissioner

The Minister for Transport, Mr Peter Morris, has announced the appointment of Mr John MacMillan as the new Commissioner of Australian National.

Mr MacMillan replaces Mr Charles Clements who retired as a Commissioner in October 1986.

Mr MacMillan lives in Spreyton, Tasmania, and is married with three adult children.

He brings with him not only skills and experience on transport matters, but also knowledge of Tasmania, and its special transport needs.

Mr MacMillan has had almost 20 years experience in managerial positions with the Mayne Nickless Group, covering road, rail and sea freight, local transport services and commercial negotiations.

Mr John MacMillan

This is an important period for Tasrail. The Government's agreement with AN which provides $52.4 million to underwrite Tasrail operations is now midway. Strategies to improve efficiency of Tasrail and now well in hand. The period from now until May 1988 will be a particularly challenging one for all involved in AN's Tasrail operations.

Westrail wins Staff Award

Westrail has won a major award for staff communications, 12 months after public criticism of low morale and poor communications within the organisation.

The award, by the WA Chamber of Commerce and Industry, was for the best employee communications by a government department or authority during 1986.

Westrail's winning portfolio of publications ranged from a monthly news magazine to a booklet about retirement and a year planner sent to all 6,000 staff last Christmas.

Powerful Experience

A Queensland joint venture for the Main Line Electrification Project

The CLYDE/ASEA-WALKERS joint venture provides Queensland Railways' Electrification Project in Central Queensland with a wealth of engineering experience. This powerful venture combines ASEA know-how and advanced technology in the field of AC electric locomotives, with the extensive experience of Clyde Engineering and Walkers Limited in the design and manufacture of rolling stock.

ASEA has more than 70 years experience in electric traction and in particular more than 15 years experience in electric traction with thyristor techniques.

Clyde Engineering Motive Power Division has been a constant supplier of locomotives and other railway rolling stock for more than 90 years. In 1948 Clyde became the first Associate of the Electro-Motive Division of General Motors Corporation to manufacture the GM diesel electric locomotive outside the domestic USA.

Since that time, Clyde has supplied over 1000 diesel electric locomotives to Australian Railways.

Walkers Limited has been involved in the design and construction of railway rolling stock since 1890. More recently they have supplied large numbers of diesel hydraulic locomotives and stainless steel EMU vehicles to Queensland Railways. A total of 280 EMU vehicles have been ordered so far, including the new inter-urban trains to run between Brisbane and Rockhampton by 1989.

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New publications from AN

Australian National has introduced two new publications to inform staff of the system's performance and highlighted significant activities involving or affecting AN employees.

The two publications are AN Facts and AN Focus.

AN Focus is a new quarterly feature magazine, while AN Facts is a reference document containing key information about AN business and future direction.

AN Focus is intended to help the system's 'key publics' be better informed about issues important to the continued development of AN as a competitive enterprise.

The first issue deals with 'competition' and what AN is doing to ensure its business grows and prospers in the fiercely competitive market for freight transport in Australia.

Australian National

Number 1

March 1987

FREIGHT A FIERCELY COMPETITIVE BUSINESS

NEW MOVES BY AN TO INCREASE SHARE OF MARKET

The market for freight in Australia's main
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ail is pitted against the world's
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and get maximum efficiency
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Superfreighter – rail's answer to the challenge to earn a bigger share of the long-distance dollar.

By the end of 1986, Superfreighters operating in and out of Adelaide were carrying 7,000 tonnes a week. Australian National expects to earn over $11 million from Superfreighter and related services in the 1986/87 year.

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way of life.
are still a 'lifeline'.
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we still provide a vital
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rcial' business we aim to
are now covering 90% of full
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million) was 85% of AN's
36.
ervice obligations' (CSOs)

on behalf of the federal government in two other areas – passenger trains and freight in Tasmania (Tasrail). These receive special revenue supplements to cover losses. These are fixed in advance and strictly controlled. Our goal for Tasrail is also to eliminate the need for government support by the mid-1990s.

AN Focus is a new series aimed at providing information on the background to developments in AN. New issues will be published up to 4 times per year.

Many changes are occurring in AN, affecting many people. This includes our customers, our employees, union officials and the public at large. Naturally they want to know what is happening and why. Parliamentary representatives and their public service advisors are also very interested. Change and the clash of interests are the life blood of the news media. We get a lot of coverage in the press, not all of it well informed. AN Focus will provide information to all of these groups.

Whatever your interest in AN, I invite you to read on.

D.G. Williams

D.G. Williams
General Manager

New lubricants for rail track points

Trials being carried out by UK railway scientists into new lubricants and self-lubricating dry bearings for junctions in rail tracks could eventually lead to the elimination of manual lubrication of points.

Points and fishplates on rail track are traditionally lubricated by manual application of either oil or grease to the relevant sliding surfaces, but British Rail research scientists are evaluating superior lubricants that will reduce the frequency of application.

A further development of self-lubricating dry bearings incorporated into the cast iron baseplates of the points could completely eliminate the necessity of manual lubrication in the long term.

The development of improved lubricants had led to their trial use on points in the new track layout at Crewe in the English Midlands where spray lubricants are applied from a portable backpack spray unit.

Various lubricants are applied to the points with constant evaluation of the results by scientists to ensure that the most effective technical and economical lubricant is ultimately adopted.

Tests with self-lubricating dry bearings are being carried out at Shireoaks in another part of the English Midlands where they have been incorporated in a number of pairs of points at a busy junction.

Initial results show the dry bearings have worked satisfactorily for over seven months, including the winter period, without any direct lubrication.

Further developments could lead to plastic baseplates or plastic encapsulated cast iron baseplates being incorporated in points to further improve their effectiveness.

With their possible eventual adoption throughout the British Rail network, the use of dry bearings could show considerable savings in track maintenance costs.

The lubrication of fishplates — the connection between lengths of non-welded track — is also being investigated so that inspections can be extended from the present maximum of one year. Anti-wear paints which can be applied over oil and uneven surfaces are to be evaluated in an attempt to achieve a two-year durability.

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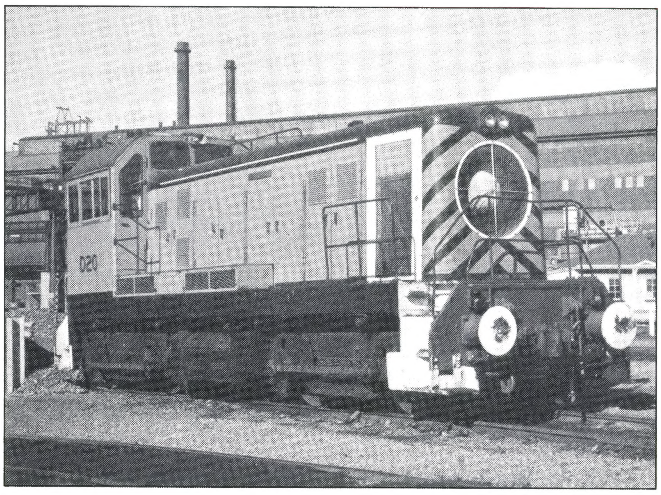

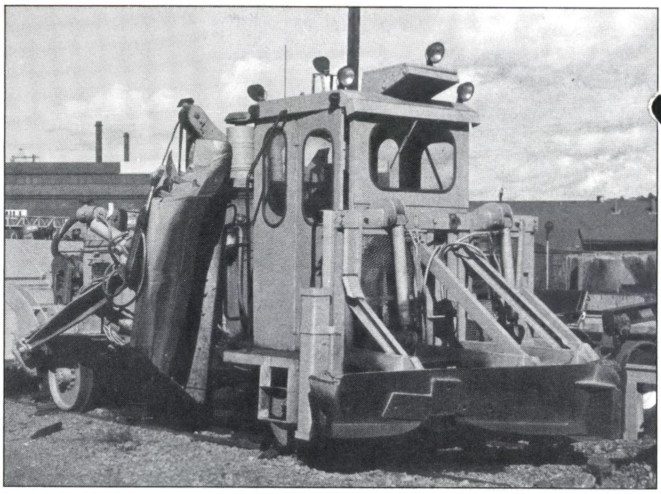

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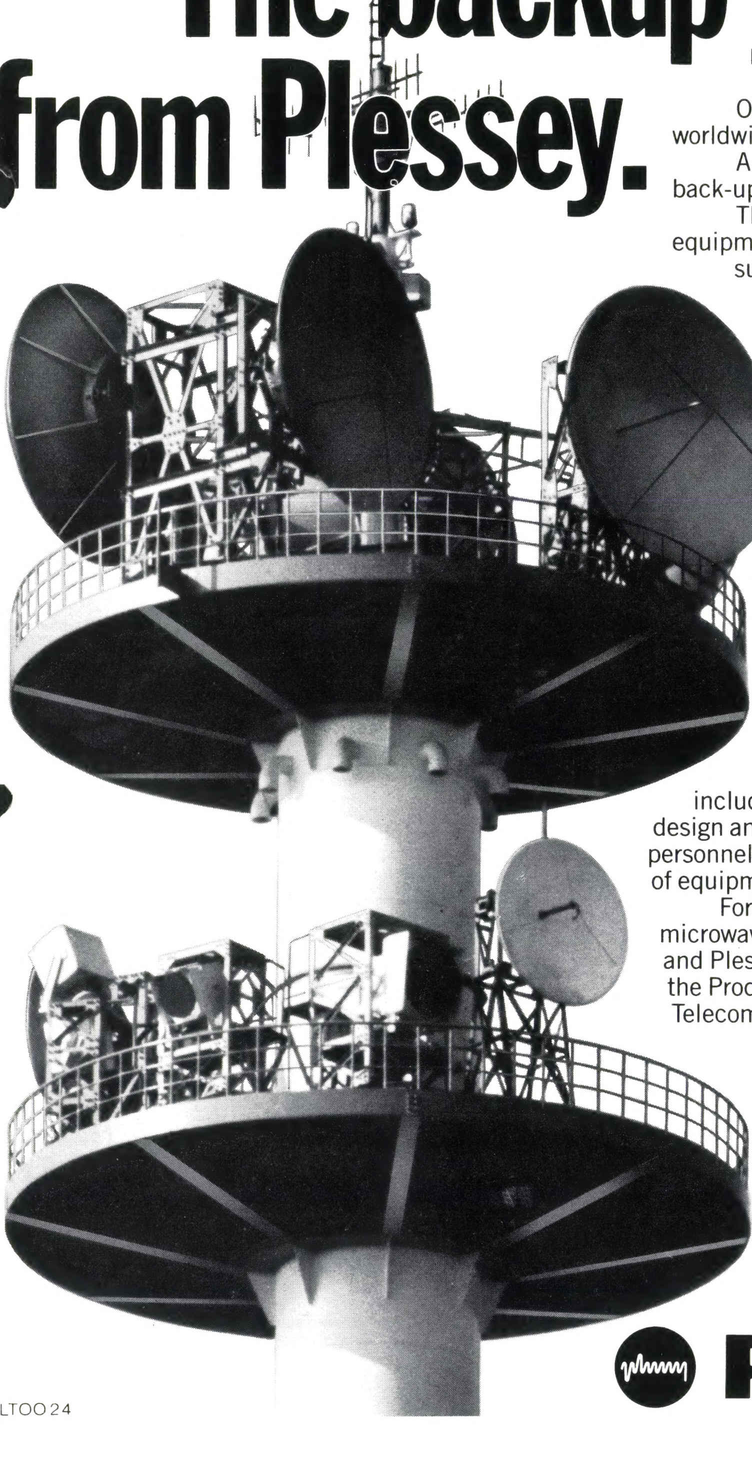

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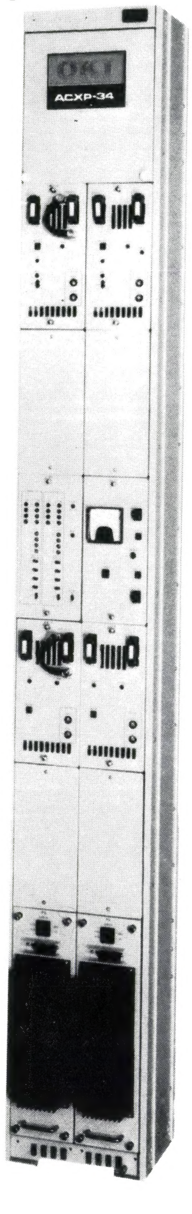

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